

PROMISE FULFILLED?:
A YIN-YANG OPPORTUNITY-OUTCOME-PROCESS (O-O-P) FRAMEWORK
FOR THE INDIVIDUAL-OPPORTUNITY (IO) NEXUS

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GLOSSARY

A-EE	Actor-EE, Actor-External Enablers
A-E-M	<u>A</u> ntecedents → <u>E</u> nds → <u>M</u> eans
A-NV1	Actor-NVI
AFC	Asian financial crisis
BdpO	A ‘balanced’ demand-product orientation
Dialectical duality tenet	Paradoxical and dualistic characteristic of yin-yang
DD-nexus	An opportunity arising from demand-demand interaction/contagion in the social marketplace
DS-nexus	An opportunity arising from demand-supply interaction in the product marketplace
Dynamic duality tenet	Temporal and evolving characteristic of yin-yang: transformational, malleable, multiple, divisible
EDE	<u>E</u> xistence of opportunities → <u>D</u> iscovery of opportunities → <u>E</u> xploitation of opportunities
EE	External Enablers
Entrepreneurial opportunity	See ‘venture-opportunity’
FQs	Field Question/s
GUI	Graphical User Interface
Holistic duality tenet	Comprehensive and systematic characteristic of yin-yang
Instrumental means (of opportunity)	The ‘means’ taken to fulfill/meet the opportunity
IO-nexus	Individual-Opportunity Nexus
MdO	Market/demand-oriented
MME	Management, Marketing and Entrepreneurship
M-pO	An orientation that is more demand than product inclined
NVI	New Venture Ideas
OC	Opportunity Confidence
O-O-P	<u>O</u> pportunity → <u>O</u> utcomes → <u>P</u> rocesses
Opportunity-hexadecadrant	A 4x4 matrix-grid of opportunity-cells, 8 of which are DS-nexuses, 4 DD-nexuses, and 4 SS-nexuses
P-mO	An orientation that is more disposed towards product than demand
Paradox #1	Opportunity exists but is unobservable, unknowable, or undetectable

Paradox #2	Opportunity and entrepreneur constituents in the IO-nexus are independent but interdependent
Performance-outcome	It is the actual outcome that relates ex-post to starting a venture, i.e., a performance-related product
P&V strategy	“ <u>P</u> oole & <u>V</u> an de <u>V</u> en” strategy
P&V strategy #1	Accept and use the theoretical tensions constructively
P&V strategy #2	Clarify the levels of analysis
P&V strategy #3	Separate temporally the two levels
P&V strategy #4	Introduce new terms to resolve the paradox
Quadrant I	Discovery opportunities (DO)
Quadrant II	Constructionist opportunities (CO)
Quadrant III	Creation opportunities (CrO)
Quadrant IV	Regression opportunities (DO)
PEST	Political and legal, Economic, Social, and Technological
PsO	Product/supply-oriented
Root-origin (of opportunity)	Source/cause (of opportunity), also the isomorphic outcome or ‘ends’
RQs	Research Question/s
SS-nexus	An opportunity arising from supply-supply interaction in the factor marketplace
Taijitu	A yin-yang symbol that signifies a natural integrated wholeness composed of contradictions
USFDA	United States Food and Drug Administration
Venture-opportunity	Refer also to as ‘entrepreneurial opportunity’ in extant literature, venture-opportunity is a unique subset of market-opportunity formed and exploited at the start-up venture level
Venture-outcome	An outcome that relates specifically to the particular opportunity (or venture-opportunity) pursued by the start-up venture
Venture-segmenter	A startup-venture that does not change the makeup of its initial opportunity
Venture-stayer	A startup-venture that <i>segments</i> its market of its initial opportunity
Venture-streamliner	A startup-venture that streamlines the instrumental-means for meeting the initial opportunity’s root-origin
Venture-subverter	A startup-venture that subverts the initial root-origin of its initial opportunity with the instrument-means (thereby becoming the quasi root-origin)

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Pascal says, “Certain authors, speaking of their work, say ‘my book’ . . . They would do better to say ‘our book’.” Indeed, this is “our” thesis because in it there is knowledge from the referenced scholars and their predecessors. I have also gleaned understanding from people I interacted with over the years. It is difficult to recall all of them; so, my apology for not naming them individually.

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ABSTRACT

This thesis submits its conceptual opportunity-outcome-process (O-O-P) framework to complement and operationalize the *dualistic* individual-opportunity (IO) nexus notion (Venkataraman, 1997) as an integrated theory of startup entrepreneurship. Person-centric research has hitherto failed to explain the entrepreneurial phenomenon, while opportunity-oriented studies are “elusive” (Dimov, 2011) and fragmented by the Western ‘*either/or*’ views of objectivists and subjectivists regarding opportunity’s ontology. Hence, the IO-nexus notion has been handicapped in delivering the “promise of entrepreneurship as a field of research” (Shane & Venkataraman, 2000) based on the interaction between entrepreneur and opportunity.

To advance the IO-nexus notion in entrepreneurship research, the O-O-P framework reframes, ‘defragments,’ and integrates the received Western dialectic views with the ‘*both/and*’ logic of the Chinese *yin-yang* duality notion as the alternate metatheory on opportunity. Opportunity’s ontological nature is thus rationalized as a *dualistic* nexus with the *interacting* forces of demand and supply alternating as *either* the ‘source’ or ‘root-origin’ (also the isomorphic outcome or ‘*ends*’) of opportunity, *or* the instrumental-*means* to fulfill the opportunity. The *opportunity-hexadecadrant* is introduced to visualize opportunities as *dualistic* demand and supply nexuses under different yin-yang market-settings. It also operationalizes the IO-nexus by helping to deduce the special role of opportunity’s root-origin in defining on an *a priori* basis the essential aspects of starting up: the *types* of opportunity (with their respective risk-uncertainty profiles and level of entrepreneurial and innovative effort involved), *outcomes*, *orientations*, entrepreneurial *process*, and *antecedent-ends-means* linkages. Applying the yin-yang *Taijitu*, the thesis identifies a fourth epistemology—*regression*—to complement extant positivist-realist, constructionist, and evolutionary-realist discourses on the formation and exploitation of eight types of opportunities.

Qualitative multiple-holistic case studies reveal literal and theoretical replications generalizable analytically to the O-O-P framework’s propositions: opportunities are *dualistic* nexuses of demand-supply or supply-demand configurations in different yin-yang market-settings, and have *a priori* outcomes that determine their interactions with the individual in the *dualistic* IO-nexus. This sets forth the O-O-P framework and the dualistic IO-nexus notion as a single integrated *a priori* theory to fulfill entrepreneurship as “a distinctive domain” (Venkataraman, 1997, p. 123).

Chapter 1 – INTRODUCTION

This first chapter introduces the background of entrepreneurship research to identify theoretical gaps and ascertain the research questions. It also provides the setting for this study to explain the entrepreneurship phenomenon as a nexus of interaction between the individual and opportunity.

1.1 Background to research: The economic importance of new venture

New ventures at the start-up or entrepreneurial stage are critical to a country's economy, particularly in the area of job creation. Data gathered by Stangler and Litan (2009) from the U.S. Census Bureau (see Figure 1.1) shows that almost all the *net* job creation in the United States during 1980-2005 happened in 'start-up firms' (defined as "age zero" firms).

Figure 1.1 – The first source of job creation: Start-ups

Source: Stangler and Litan (2009, p. 5), which is in turn extracted from U.S. Census Bureau, Business Dynamics Statistics, at <http://www.ces.census.gov/index.php/bds>

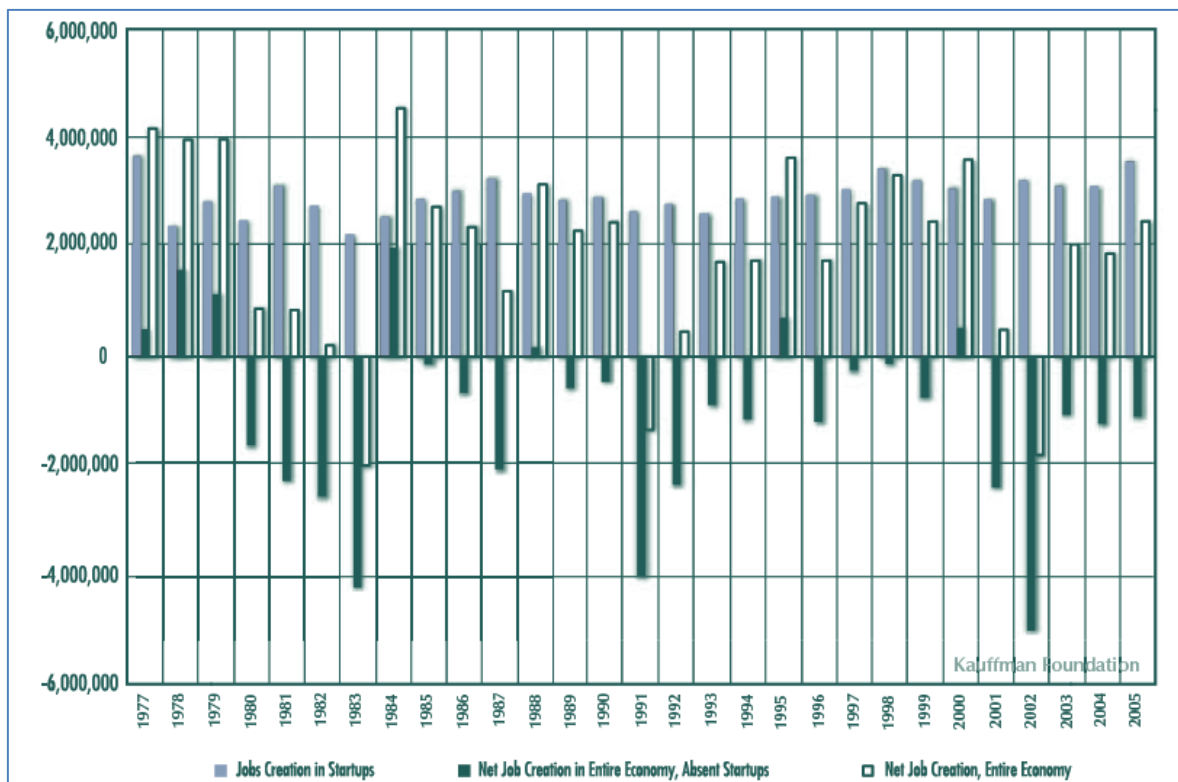
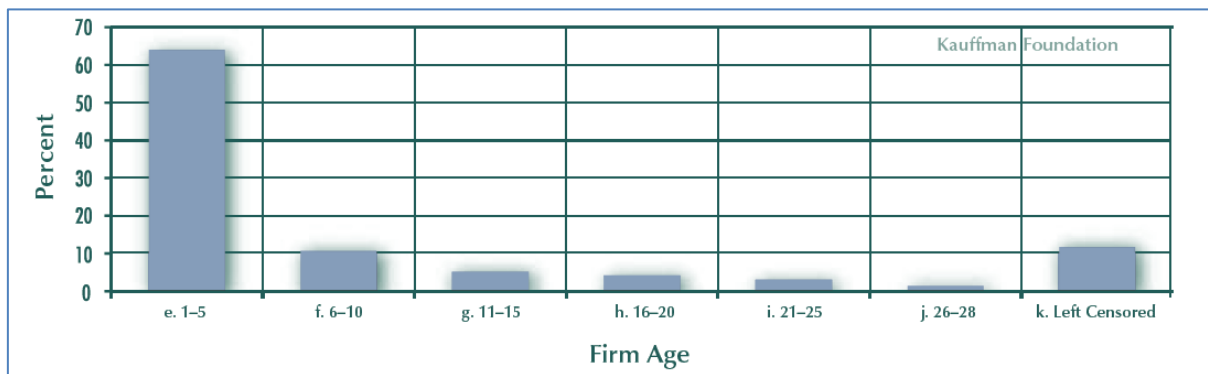


Figure 1.1 also shows that absent start-ups, net job creation in the United States would have been negative in 22 of the 29 years during the period 1977-2005. However, the amount of new jobs created does differ among start-up firms. As Figure 1.2 shows, ‘young’ firms (of less than five years old) accounted for nearly two-third of the overall 12 million new jobs in 2007 alone.

Figure 1.2 – Young firms account for the largest share of job creation

Source: Stangler and Litan (2009, p. 6), which is in turn extracted from Special Tabulation by U.S. Census Bureau for Kauffman Foundation from Business Dynamics Statistics



Other than job creation, new companies are key engines of economic and social development (Acs & Audretsch, 2010), long-term wealth creation (Ahuja & Lampert, 2001; Marvel & Lumpkin, 2007), tax revenues, exports, and national productivity. Entrepreneurial ventures are also the major contributors of innovation (Acs, 2010). Sahut and Peris-Ortiz (2014) observe the “union” of small business, entrepreneurship, and innovation (new combinations of factors of production and processes), although the latter cannot always be construed as a business superiority. In an earlier study, Baumol (2002; 2004 June) found that large businesses accounted for nearly three-quarters of U.S. expenditure on research and development; but the bulk of radical, and fundamentally the most novel, innovations in the economy was provided by small businesses.

1.2 Research focus: Start-up activities

The incidence of failure among new ventures is high, despite their economic contributions. Data from Canada and the United States indicate that historically between one-third and two-fifths respectively of new firms would fail within the first two years of conception (Amit, Brander, & Zott, 1999; Stangler & Litan, 2009). As Amit et al. (1999) remark, “No economy could long survive if every year’s new jobs were simply eliminated within such a short period” (p. 2). Given the economic importance of new ventures to a country, it is clearly sensible for policymakers and researchers to focus their attention on helping them to survive beyond the start-up phase.

1.3 Research issues

In view of the discussion above, a research area where scholars can help is to guide entrepreneurs in the start-up process by providing clear insights and explanations (Davidsson, 2015). This is a challenging task because the topic of start-up entrepreneurship covers a plethora of complex issues that include many variables and outcomes.

1.3.1 Dynamic nature of start-up issues

To begin with, the start-up stage is a time when the organizational structure of a new venture is informal, if not disorganized. The start-up entrepreneur must address not only the *internal* organizational changes that do happen, but also a range of activities that are much wider than “simply starting, or running, a small business” (Kuura, et al., 2014, p. 217). In particular, a startup-venture commencing the pursuit of opportunity is *inaugurating* “the very first *project* in the life cycle of every organization, where there is substantial *uncertainty* and *risk*” (Kuura, et al., 2014, pp. 227, emphasis added) stemming from the external environment. Lerner and Shepherd (2009) also share such a view. Hence, a theory on start-up entrepreneurship will need to elucidate the risks, uncertainties, and the influence of external environmental forces.

Moreover, if the pursuit of opportunity does in fact represent the inauguration of a first project, then a theory on the start-up phenomenon must explain *how* the venturing process works.

1.3.2 IO-nexus notion

From a *process* standpoint, entrepreneurial pursuit can be rationalized as a nexus involving individuals and opportunities (Venkataraman, 1997), or an **IO-nexus** phenomenon. In fact, entrepreneurial process is a product of interaction that happens as the individual pursues opportunity.

The IO-nexus notion originated as a parsimonious attempt to rationalize entrepreneurship as a scholarly field seeking to understand “how opportunities to bring into existence ‘future’ good and services are discovered, created, and exploited, by whom, and with what consequences” (Venkataraman, 1997, p. 120). Shane and Venkataraman (2000) further clarify the notion by describing entrepreneurship as a process of “how, by whom, and with what *effects* [or outcomes] *opportunities* to create future goods and services are discovered, evaluated, and exploited” (pp. 218, emphasis added). In brief, the entrepreneurial *process* is an IO-nexus that involves (a) the *individual* as the entrepreneur-actor, and (b) sources of *opportunity*, for achieving (c) the *outcome/s*.

The notion that entrepreneurial process is a nexus that depends on opportunities *and* individuals as the “first-order forces” (Shane & Venkataraman, 2001, p. 14) is a core idea in the field of entrepreneurship towards which consensus have moved (Shane, 2012, p. 18). For researchers to contribute meaningfully to the understanding of the entrepreneurial phenomenon as a process in the context of the IO-nexus, they will need to examine:

- (a) the mechanisms by which entrepreneurial opportunities and enterprising individuals interact with each other in the entrepreneurial process (Canina, Palacois, & Devece, 2012, p. 273); and
- (b) the outcome.

As part of the examination, researchers will have to explain the nature of entrepreneurial opportunities and the characteristics of the individual. However, the predicament for research is that while human agency is acknowledged in the process of entrepreneurship (Shane, 2012, p. 17), academic literature to-date has not been able to ascertain conclusively the sufficiency and criticality of *entrepreneur* with regard his/her role, traits, and characteristics in explaining the entrepreneurial process and its outcome. There are serious problems with person-centric definition of entrepreneurship (Shane & Venkataraman, 2000). Studies that focus on the individual are “incomplete . . . [and do] not include consideration of the variation in the quality of *opportunities* that different people identify ... [and] lead researchers to neglect to measure opportunities” (pp. 218, emphasis added). In concurring, Davidsson (2015) says, “[K]nowledge about the person alone cannot explain entrepreneurial *action* and *outcomes*” (p. 674).

As a recourse to elucidating the entrepreneurial process, scholars like Drucker (1985a) and Vesper (1991) have turned to the *opportunity* construct of the two-factor IO-nexus for insights, a research redirection that aligns with Shane’s (2012) call to think “also about the *opportunities* [that] those people identify, evaluate, and exploit” (2012, pp. 15, emphasis added). In this connection, Venkataraman and Sarasvathy (2001) emphasize:

“[I]f we are to understand entrepreneurial opportunities, we have to delve into the preconditions for their existence.” (pp. 8, emphasis added)

Suddaby, Bruton, and Si (2015) add that “*where opportunities come from*” (pp. 1, italics added for emphasis), i.e. the *ontology* of opportunity, must also be included as it is “the core puzzle of entrepreneurship research.” Furthermore, researchers must help the entrepreneur of a startup-venture to understand and “measure the effects of opportunities” (Shane, 2012, p. 17) to be pursued and achieved by the entrepreneurial process. Absent such understanding and measurement:

“. . . the effects of opportunities will be misattributed to individuals and the effects of individuals on entrepreneurship will be systematically overstated.” (Shane, 2012, p. 17)

Aside from opportunity's *ontology* and *effects*, Shane and Venkataraman (2001) urge scholars to think also about the *process* of forming and exploiting opportunities, which is of concern to startup entrepreneurs:

“... *why, when, and in what form opportunities come into existence . . . when people exploit opportunities [and] how the nature of opportunities themselves influences the decision to exploit . . . why, when, and how different modes of action are used to exploit entrepreneurial opportunities*” (p. 16).

Simply put, researchers can serve the interests of entrepreneurs by explaining (a) the *ontology* of opportunities, (b) how opportunities *influence* their decisions to exploit them, and (c) the interactions that occur in epistemological *process* of forming, and exploiting opportunities – specifically, how opportunity influences the entrepreneurial process and is influenced by it.

However, the opportunity construct has been elusive. Its *ontological* nature is a “profound philosophical question” (Kirzner, 2009, p. 150) confounded and polarized by western ‘either/or’ dialectical logic (Li, 2008) that guides the thinking of the *objectivists* and *subjectivists*. The *former* for instance would argue that opportunities *do* exist but await discovery by the enterprising individual and hence yet to commence. Thus, the IO-nexus becomes a mere *overlap* between opportunity and the entrepreneur as two distinct and separate constructs that exist but without any interdependency. The *subjectivists* on the other hand maintain that opportunities *do not* exist as the entrepreneur have yet to construct them socially; in which case the individual becomes the *sole* driver of the entrepreneurial process over which opportunity has *no effect* whatsoever. The IO-nexus thus loses its identity and relevance altogether. Yet paradoxically, *epistemological* traditions (like constructionist, and evolutionary-realist) that take the subjectivist view when explaining how opportunity is formed and exploited do *implicitly* require the presence/existence of *objectivist* attributions – that is, that opportunities exist *a priori* as objective external realities, albeit “potentially unobservable” (Alvarez, Barney, & Young, 2010, p. 24), and have an effect on the entrepreneurial process.

With the opportunity construct beleaguered by confusion, paradoxes, and incoherencies imposed by the mutually exclusive ‘either/or’ dichotomous philosophical perspectives of the objectivists

and subjectivists, the IO-nexus has not been able to fulfill its potential as a notion in explaining entrepreneurship as a process of interaction between opportunity and the individual (Davidsson, 2015). For researchers to resolve the dilemma and advance entrepreneurship as a distinctive field of research, a solution may be to *contextualize* the IO-nexus notion in a conceptual framework that embraces an *alternative* philosophical perspective capable of harmonizing the views of subjectivists and objectivists (which relegate opportunity to *either* reality, *or* perception). In particular, the framework will need to rationalize opportunity as exerting an effect on the entrepreneurial process of *interdependent* interaction with the entrepreneur, despite having an *objectivist* existence that may appear to be non-existent as the *subjectivists* assert.

1.3.3 'Outcome' for the IO-nexus and causal relationships

Other than the need to understand the ontology and measure the *effects* of opportunity, Zahra and Dess (2001) recommend that a theory on the entrepreneurship phenomenon such as the IO-nexus notion should recognize and explain the *outcomes* of the entrepreneurial process, “whether these outcomes are positive or negative, immediate or long term, or tangible or intangible” (p. 8). Shane and Venkataraman (2001) agree. The major concern however is there can be many outcomes other than business performance (Shane, 2012). Extant approaches for determining the venture-outcome of a new start-up on an *ex-ante* basis are either subjective or unsatisfactory, particularly when the determination of outcome is influenced by the different types of aspirations that new ventures are known to pursue (Mueller, Volery, & von Siemens, 2012). Even on a *post hoc* basis, actual outcome is also difficult to determine because it is debatable whether the yardstick for measuring *performance* should be financial or nonfinancial, or a combination of both. Furthermore, *post hoc* outcome offers no theoretical or practical value. For the purpose of a startup-venture, the *ex-ante* outcome (or ends) to be achieved by the entrepreneurial process (or means) must be understood at the very least; otherwise, the entrepreneurial process will lack focus and direction. Hence, there needs to be an objective way of understanding the venture-outcome on an *ex-ante* basis. Such knowledge will also help to unravel the convoluted and challenging causal interdependencies between the ends and the means.

Despite its significance however, the nature of *ex-ante* outcome is not clearly defined or understood in both extant literature and practice. Knowing the *ex-ante* outcome will operationalize entrepreneurship theory because the causal relationships can *then* be determined to avoid contentious discussions over the circularity issue of whether end→means, or means→end (Whittaker, et al., 2009).

1.4 Research questions

Heeding the comments above, this thesis intends to develop a parsimonious conceptual opportunity-outcome-process (**O-O-P**) framework that integrates the IO-nexus notion in describing and explaining *how* the individual interacts with opportunity in the nexus of entrepreneurial process of a new venture. To do so, the integrated theory will need to:

- (a) examine the nature of *opportunity* that the entrepreneur interacts with, and the influence it has on the venturing process,
- (b) rationalize the nature and determinability of *outcome* (ends) on an *ex-ante* basis for the new venture to be guided in the start-up entrepreneurial process,
- (c) describe the nature of the venturing *process* (means) for the new startup to achieve the *ex-ante* outcome (Mueller, et al., 2012; Shane, 2012; Shane & Venkataraman, 2001; Zahra & Dess, 2001).

In a nutshell, the process taken to develop the conceptual framework will involve investigating the following key research question (**RQ**):

“*How does opportunity influence the outcome and process of new venture development at the start-up stage?*”

As various scholars have pointed out, answers to the ‘how’ question help to explain the operational process and links that happen *over time* (Shane & Venkataraman, 2000; Yin, 1994).

This entails asking the following questions that relate more specifically to the ontology and influence of opportunity on the start-up process, as part of the overall research investigation:

- RQ1. What is the ontological nature of entrepreneurial venture-opportunity?
- RQ2. What are the different types of start-up entrepreneurial venture-opportunity?
- RQ3. How are the various types of start-up entrepreneurial venture-opportunity formed and evaluated?
- RQ4. What are the relevant venture-outcomes for the various types of start-up entrepreneurial venture-opportunity?
- RQ5. How are the venture-outcomes for the various types of start-up entrepreneurial venture-opportunity formed?
- RQ6. How do the venture-outcomes get oriented and prioritized?
- RQ7. What are the actions and processes taken in connection with the respective venture-outcomes?
- RQ8. How does the entrepreneurial process get oriented?
- RQ9. What are the factors that might moderate or change the venture-outcomes and the entrepreneurial process taken to achieve the venture-outcomes?

1.5 Research objectives

Underlying the RQs is the reflexive need for an alternative:

“... metatheoretical intervention . . . to promote scientific progress when substantive inquiry cannot sufficiently adjudicate the truth, soundness, or validity of (a set of) empirical propositions.” (Ramoglou & Tsang, 2016, p. 411)

The *primary* objective of the RQs is to help uncover an alternative metatheoretical position or philosophical ‘worldview’ for the conceptual O-O-P framework to resolve the theoretical oppositions (Poole & Van de Ven, 1989) caused by the Western ‘either/or’ dichotomous views in extant literature. Hitherto, these views have handicapped the progress of IO-nexus notion in explaining entrepreneurial phenomenon and the “promise” of entrepreneurship as a distinctive domain of research inquiry (Shane, 2012). Specifically, the aim for the metaphilosophical position is to “generat[e] sequences of theories, progressively richer in explanatory power” (Bhaskar, 1998, p. 46) for the domain of entrepreneurship research.

Another objective is to conceptualize and develop the O-O-P framework to help “the median entrepreneur . . . know what he or she is doing” (Shane, 2012, p. 14) by offering conceptual but operationalized explanations on the nature of key variables involved in the start-up entrepreneurial process, the *causal ends-means relationships* among them, and the *a priori venture-outcome* to achieve. Answers to the RQs will also contribute a set of future inquiry avenues to advance the IO-nexus in the arenas of research, practice, and policy-making.

1.6 Thesis structure

To accomplish its research objectives, the structure of this thesis is organized as follows. Chapter 2 reviews extant seminal works to provide an overview and understanding on those aspects of entrepreneurship that are relevant to the conceptual O-O-P framework, such as entrepreneur, opportunity, outcome, and entrepreneurial process as contextualized by the IO-nexus. The thesis will examine and explain the nature and substance of opportunity itself, since it is the *object* of *what* the entrepreneur does (Gartner, 1988). The examination will cover the ontology (i.e., what, where and when) and formation epistemology (i.e., how) of opportunity. A discussion on the different *types* of opportunity then follows.

Having examined the extant perspectives on the aspects that are relevant to the conceptual O-O-P framework, Chapter 3 develops and explains the independent-dependent relationships and their orientations. It reframes, defragments, and integrates the extant philosophical ‘either/or’

perspectives of opportunity's ontology and epistemology with the Chinese yin-yang duality notion. This rationalizes *opportunity* as the antecedent variable in the IO-nexus, making it teleologically coherent and robust when explaining its *influence* on the nature of the venture-outcome (end or effect) and entrepreneurial *process*, where the 'entrepreneur' counterpart is unable. While Chapter 2 shows that various outcomes are possible, Chapter 3 demonstrates that an *a priori* intrinsic *venture-outcome* does exist as either demand-oriented or product-oriented, which in turn guides and aligns the orientation of the entrepreneurial process (means) for achieving the venture-outcome. In line with deductive logic, the *a priori* causality patterns of the conceptual framework for startup venturing is then rationalized and explained as antecedent→ends→means (A-E-M) in the *order* of opportunity→outcomes→process (O-O-P). In particular, Chapter 3 identifies the *root-origin* (source or cause) of opportunity as the aspect that unifies and orientates the start-up entrepreneurial process. In essence, the conceptual O-O-P framework will “cull together a baseline model of *entrepreneurial expertise*” (Venkataraman & Sarasvathy, 2001, p. 18) for start-up entrepreneurs, regardless of the diversity in their background and experiences.

Chapter 4 discusses the research methodology (as guided by the set of RQs) that is used to streamline the empirical investigation of the conceptual O-O-P framework with regard its relevance, generalizability, predictability, and control in describing and explaining real life start-up opportunity-venturing situations. Chapter 5 reports the empirical findings from the qualitative multiple-holistic case studies based on in-depth talk-aloud interviews with nine entrepreneurs of 13 startup-ventures having 18 high-tech opportunities. It also presents the analytical generalizability of findings to the explanations of the conceptual framework. Chapter 6 concludes the thesis by integrating discussion of the findings, their quality, and contributions to entrepreneurship research and practice.

1.7 Practical significance and robustness of the research

The formative period that lays the foundation for a new venture is the most intense and tumultuous phase when it is trying to start up and pursue its venture-opportunity. To help

entrepreneurs navigate the start-up process, this thesis provides the Chinese yin-yang duality philosophy as the embracive metatheoretical underpinning for the conceptual O-O-P framework to be a parsimonious *a priori* theory that explains, predicts, and operationalizes the opportunity antecedent and the IO-nexus with *ex-ante* venture-outcome and orientations for the entrepreneurial process of new ventures. The conceptual framework will also explain $O \rightarrow O \rightarrow P$ as being the $A \rightarrow E \rightarrow M$ sequence of causality connections to provide clarity for the roadmap that the start-up entrepreneur needs when *person-centric* studies are unable to explain because of the variability and relativism in individuals and their characteristics. Despite the focus on the start-up stage, it is worth keeping in mind that the insights and explanations of the conceptual O-O-P framework can apply equally well to large corporate settings (Roberts, et al., 2007). The fundamentals remain the same.

At the startup-venture *firm* level, knowing how to conduct the entrepreneurial process to pursue opportunity can help to mitigate failures and/or delays. As Davila, Foster, and Gupta (2002) point out, “[d]elayed execution may have significant negative consequences in the ability of the start-up to be successful” (p. i), and/or seize early-mover advantage in the market. At the *macroeconomic* level, knowledge of the processes and challenges of startup-ventures will help policy-makers to design, implement, and promote appropriate programmes to support entrepreneurship, sustain job creation, and enlarge the country’s innovation capacity.

1.8 Chapter Summary

This chapter has highlighted pertinent aspects of entrepreneurship that provide the bases and rationale for constructing and developing the conceptual O-O-P framework with the Chinese yin-yang duality paradigm as the metaphilosophy to explain the start-up entrepreneurial phenomenon. This chapter establishes the RQs, articulates the thematic typology for its conceptual O-O-P framework, and describes how this thesis is structured to accomplish its research objectives.

Chapter 2 – LITERATURE REVIEW

Gartner (1985) professed three decades ago that entrepreneurship is a multi-dimensional phenomenon. It involves multiple themes such as entrepreneur, opportunity, process, outcome, risk, uncertainty, and innovation. Being a *process* that happens over time and space, the entrepreneurship phenomenon is challenging for researchers to examine and explain as it is in a “dynamic, discontinuous change of state” (Bygrave, 1993, p. 255).

This chapter reviews extant literature, covering “variables of interest” (Zahra & Dess, 2001, p. 8) to the development of this thesis’ conceptual O-O-P framework which seeks to explain and operationalize the start-up entrepreneurial process as a nexus phenomenon between opportunity and the enterprising individual (Venkataraman, 1997). Hence the relevant variables to be reviewed will include the dimensions of ‘entrepreneur’ as an individual, the characteristics and nature of ‘opportunity,’ the ‘entrepreneurial process,’ and also the ‘outcomes’ (Shane & Venkataraman, 2001).

This chapter proceeds as follows. The first section reviews the evolution of entrepreneurship research through to 2000 when the journal article of Shane and Venkataraman (2000), *The promise of entrepreneurship as a field of research* (referred herein as “**Promise**”), was published to advance Venkataraman’s (1997) proposition of the entrepreneurial process as a IO-nexus involving individuals and opportunities. The second section provides an overview of the IO-nexus, which is the context upon which the O-O-P framework is conceptualized. Controversies regarding the IO-nexus are discussed in the third section, particularly the criticism of the ‘sequence’ of entrepreneurial *process* implicit in Venkataraman’s (1997) definition of entrepreneurship (where the *existence* of opportunities is subject to *discovery* and *exploitation*) as being too orderly. The fourth section considers the debates over the importance of environmental factors and their influences on the entrepreneurial processes. The fifth section discusses the role of individuals as entrepreneur-actors, followed in the sixth section by a review of seminal works on the ‘opportunity’ element of the IO-nexus, including perceptions about its ‘value’ in entrepreneurship research, the definitions offered, and its nature (characteristics, existence, formation, and antecedents). The seventh section discusses extant views regarding the outcomes of startup-ventures. The eighth section evaluates the merit of attempts, particularly by Davidsson

(2015), to reconceptualize ‘opportunity’ as a ‘business idea.’ The ninth and final section offers a chapter summary and identifies the potential for this thesis to develop its conceptual O-O-P framework as an integrative theory for the entrepreneurial process at the start-up stage.

2.1 Evolution of entrepreneurship research through 2000

The etymology of “entrepreneurship” is generally attributed to Richard Cantillon who first used the term in 1730. Cantillon considers entrepreneurship as *work* that is independently undertaken or ‘*entreprendre*’ (Gartner, Carter, & Reynolds, 2010), with possible risks (McMullan & Long, 1990) in terms of “buying at certain prices and selling at uncertain prices” (Roberts, et al., 2007, p. 4). Since then, research on entrepreneurship has grown such that the domain now encompasses psychology, social science, operational and strategic management, organization research, decision-making, and innovation. Entrepreneurship is undeniably a “multi-dimensional phenomenon” (Gartner, 1985, p. 697), but yet to qualify as a *distinctive* domain for research and practice (Shane & Venkataraman, 2000).

Although “considerable work” (Kumar, 2007, p. 1) has been done to define, explain, and develop entrepreneurship as a field of study (Gartner, 1990), Shane and Venkataraman (2000) note that entrepreneurship remains just “a broad label under which a hodgepodge of research is housed” (p. 217). They decry that research studies have not been able to produce a conceptual framework capable of explaining and predicting entrepreneurship as “a unique set of empirical phenomena” (p. 217). Instead, there is a myriad of “determinant” based theories and research programs that are *individually* interesting but loosely connected as a coherent *whole*. For instance, Knight (1921) deems entrepreneurship as being able to predict the future as part of his theory on *risk* and *uncertainty*. Cole (1968) relates entrepreneurship to undertakings that are profit-oriented. Kirzner (1973) links entrepreneurship to the *arbitrage* of asymmetric information by individuals who have the ability to spot market imperfections. Miller (1983) attributes risk-taking and proactiveness as determinants of entrepreneurship.

In general, such determinant-based definitions on a *standalone* are somewhat limited in their usefulness. Each of the definition is insufficient to reflect the entrepreneurial process as “a dynamic, discontinuous change of state . . . [that] . . . involves numerous antecedent variables . . . [and] is extremely sensitive to initial conditions” (Bygrave, 1993, p. 255). Low and MacMillan (1988) add that the entrepreneurship concept intertwines a complex set of contiguous and overlapping constructs¹, so that each extant definition captures only an aspect of them. Consequently:

“[S]ome observers believe that the answer to entrepreneurship theory may be found in the chaos theory – a relatively new science that was popularized by Gleick in his book Chaos: Making a new science” (Bygrave, 1993, p. 255).

2.2 The IO-nexus notion

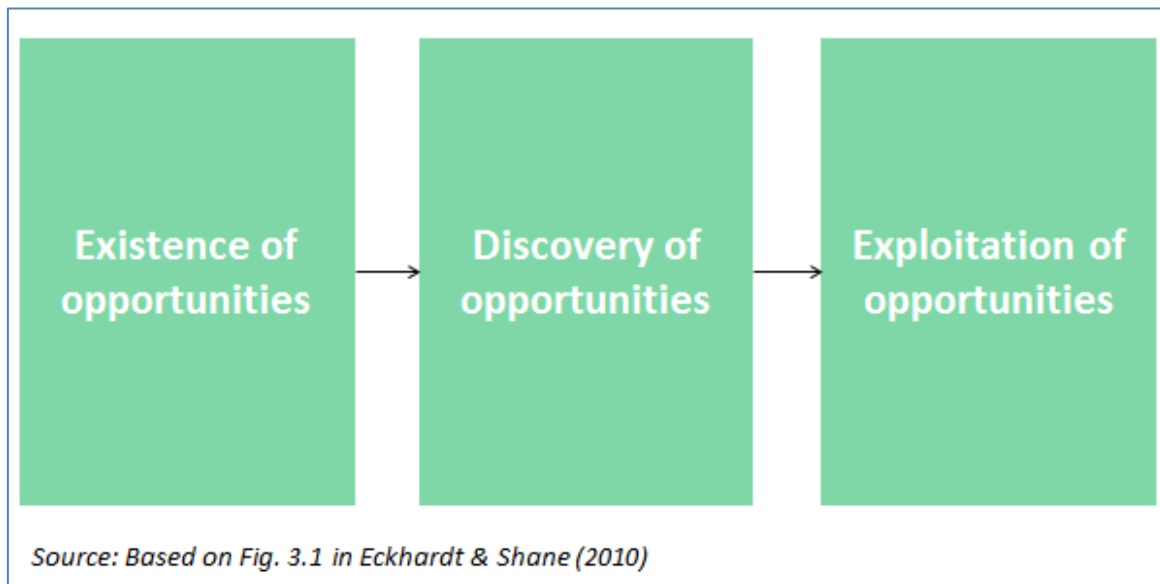
Amidst the quandary, Shane and Venkataraman (2000) expanded upon Venkataraman’s (1997) proposition of the entrepreneurial process as a nexus involving the enterprising *individual* (Sarasvathy, et al., 2010) and lucrative economic *opportunity* (Shane, 2003; Venkataraman, 1997). As a dualistic two-factor notion, the IO-nexus invokes a parsimonious construct of the entrepreneurial process, which Eckhardt and Shane (2010) clarify as involving the *existence* of opportunities, which is subject to the stages of *discovering* and *exploitation* as Figure 2.1 shows. As a result, the IO-nexus can also be termed an **EDE notion**².

¹ These constructs include “management of change, innovation, technological and environmental turbulence, new product development, small business management, individualism, and industry evolution” (Low & MacMillan, 1988, p. 141).

² While the EDE approach is more systematically developed and has a dominant position in literature, it is not without dissensions with regard the terminology on “discovery” as we shall discuss later in this study.

Figure 2.1 – The process of discovery and exploitation for existing opportunities

Source: Eckhardt and Shane (2010, p. 49)



Alvarez, et al. (2010) observe that the EDE notion of entrepreneurship is premised on the positivist-realist or ‘discovery’ view of opportunity-formation, which shall be further discussed in Paragraph (A) of Section 2.6.3.2 below. Suffice it is to note for the moment that the positivist-realist or discovery position treats the *ontology* of the ‘*opportunity*’ construct in the IO-nexus notion to be ‘*as is*’ – that is, that opportunity is a ‘given.’ As a treatise on entrepreneurship, the IO-nexus therefore takes a rather simple view of opportunity as merely a (pre)existing object that can be ‘discovered’ by the enterprising entrepreneur. The individual ‘*entrepreneur*’ is thus inadvertently elevated to the pivotal role as ‘*the actor*’ at the expense of ‘opportunity’ in the entrepreneurial process or ‘nexus’ of interaction between the individual and opportunity. While the simplicity of such an ontological position provides a *parsimoniously convenient* approach to analyzing entrepreneurship, the IO-nexus notion’s view of opportunity as a ‘given’ nullifies the need to consider its possible role as an *antecedent* that affects the nature of *outcome* and the entrepreneurial *process*. Absent explanatory details, opportunity’s influence on the entrepreneurial process can only be implied at best. In this sense, it is quite like Schumpeter’s (1934) seminal work, which is also *entrepreneur*-centric in terms of the emphasis placed on the entrepreneur’s role in creating and responding to economic discontinuities (Roberts, et al., 2007).

As Section 2.5 notes, person-centric studies have not been able to produce a framework capable of explaining and predicting entrepreneurship as an empirical phenomenon. Furthermore, the IO-nexus notion is subject to questions in several other areas (Shane, 2012), even though it is generally acknowledged to offer entrepreneurship studies a distinctive perspective. The questions include the sequence of the EDE process, the lack of consideration for environmental forces, the inability of the ‘entrepreneur’ element to explain the entrepreneurial phenomenon, and the controversies over ‘opportunity’ in the IO-nexus equation. Each of these questions is discussed below, which need to be considered and addressed by this thesis in its construction of the conceptual O-O-P framework.

2.3 Sequence of entrepreneurial process

The EDE entrepreneurial process relating to the IO-nexus has been criticized for being too restrictive, and conjuring the impression that the sequence is too orderly (Baker & Nelson, 2005) and strategically planned (Hmieleski & Corbett, 2006). In practice, as some dissenting scholars observe, the flow of the process is influenced by bricolage, that is that the entrepreneur has to make do with resource constraints (Baker & Nelson, 2005) and “whatever is at hand” (Lévi-Strauss, 1966). They also argue that the entrepreneurial process is shaped by different social structures, resulting in a range of entrepreneurial activities found within and across nations (Baker, Gedajlovic, & Lubatkin, 2005). Moreover as Baker, Miner and Eesley (2003) have found, new ventures often improvise by “extemporaneously compos[ing] and execut[ing] novel solutions to the problems and opportunities that they encountered” (Hmieleski & Corbett, 2006, p. 46). The solutions “become more elaborate over time as entrepreneurs develop them” (Ardichvili, Cardozo, & Ray, 2003, p. 109). This evolution can be seen as a competitive strategy for new entrants operating within “highly uncertain, novel, and turbulent environments” (Hmieleski & Corbett, 2006, p. 45). Accordingly, the entrepreneurial process that is conducted in such environments is “messy, non-linear” (Alvarez, et al., 2010, p.31).

In response to the criticisms, Shane (2012) clarifies that the EDE perspective of the IO-nexus notion merely reflects the subprocesses involved in the entrepreneurial process, such as

identifying, evaluating, and exploiting opportunity, which can be non-discrete and contiguous. They are not necessarily “rational, planned, strategic, or even temporally ordered” (p. 12).

2.4 Consideration for environmental factors: orientators vs. moderators

Scholars like Zahra and Dess (2001) decry the IO-nexus notion for failing to consider or “recogn[ize] environmental forces as important antecedents to entrepreneurial activities” (p. 9). Shane and Venkataraman (2001) rebut that:

“[I]ndividuals and opportunities are the first-order forces explaining entrepreneurship and that environmental forces are second-order.” (p. 14)

Shane (2012) cites “cultural, political, economic, and industry conditions” (p. 17) as examples of ‘second-order’ environmental forces that were mentioned in their 2000 article. He adds, “While [these] environmental forces might moderate the effects of individuals and opportunities, they alone cannot explain [entrepreneurship]” (Shane & Venkataraman, 2001). Shane’s (2012) reasons that:

“[The entrepreneurial process] does not spring spontaneously or mechanically from environmental conditions; rather, it occurs through the thoughts and actions of people.” (p. 17)

In fact, Shane and Venkataraman would *not* be wrong if they argue that the IO-nexus already feature environmental forces, especially the systemic causes or antecedent root-origins (or sources) of opportunity that are the ‘first-order’ component of the IO-nexus. This is a salient point that scholars like Shane, Venkataraman, Zahra, and Dess may have overlooked. As shall be discussed more fully in Paragraph (B) of Section 3.5.2.3, the *antecedent* environment forces or ‘root-origins’ that configure *opportunity* are demand and supply/product. They *orientate* the entrepreneurial process, and in this sense are different and distinct from other environment counterparts that play a *succedent* role in *moderating* the effects of entrepreneurial processes after they commence. Suffice it is to say that a change in *social* preference for healthier food, for

instance, would be the antecedent environmental force that *provides* the *demand-oriented* opportunity for entrepreneurial ventures to bring and *orientate* preservative-free products (e.g., Bakers Delight (NZ) Traditional and Continental breads) to match the new market preference as part of the entrepreneurial process. Examples of ‘healthy food’ providers include healthy-fare restaurants and health-focused grocery stores based in the United States like Chipotle Mexican Grill, Great Wraps, WhiteWave Foods Company, and Whole Foods Market. Other examples include farm-to-table firms like Foodscape (US) and Love with Food (US), and ready-to-serve home deliverers like Grain (Singapore). Social preference is thus a *first-order* environmental force. In contrast, religious sensitivity in Malaysia would be a *second-order* environmental force that Thai farmers must heed when pursuing the opportunity of supplying pork to meet consumers’ demand in Singapore. To bypass Muslim territory, the Thai farmers have to ferry the pigs by ship for slaughter in Singapore, rather than using Malaysian railway as a cheaper option.

Likewise, carbon emissions from steel and chemical plants would be *first-order* (antecedent) environmental forces that provide a *supply-oriented* opportunity for entrepreneurs like Dr Sean Simpson and Dr Richard Forster of LanzaTech (NZ) to introduce and *orientate* their enzyme-based technology for converting wastes into biofuels and biochemicals. Their solution is now trialed by Baogang Steel, Poshan, even Virgin Airways, and Boeing Company. In this connection, there can be other environmental factors acting as *second-order* succedent environmental forces that *moderate* the effects of the entrepreneurial process. For instance, they may be regulatory approvals that are needed before the solution of LanzaTech (NZ) can be integrated into the steel and chemical plants. Such regulatory hurdles are common *second-order* environmental forces that entrepreneurs in the pharmaceutical sector must contend with.

Contrary to the views of Zahra and Dess (2001) therefore, the IO-nexus as parsimonious notion does appropriately account for the first-order environmental forces that influence the entrepreneurship phenomenon. It differentiates between those environmental forces that feature naturally as antecedent root-origins that are *sources* of opportunity *per se*, and the orientation for the entrepreneurial process. They therefore qualify as *first-order* forces, as distinct from their succedent *second-order* counterparts that *influence* the process as moderators. The intrinsic ability of the IO-nexus to distinguish between environmental forces as antecedent *sources* or

succedent *influencers* hitherto being overlooked by scholars is now highlighted in this literature review.

Having clarity and understanding on the antecedent and succedent roles of different environmental forces will get researchers back on track by focusing their attention on the core IO-nexus elements of individual and opportunity (Shane & Venkataraman, 2001) in explaining the start-up phenomenon and its entrepreneurial process. This in turn can help to improve future theory building, test the effect of different environmental forces on startup-venturing activities, contextualize the results of future empirical research, and improve prescriptive theory (Stevenson & Jarillo, 1990).

2.5 ‘Entrepreneur’ in the IO-nexus

As between individual and opportunity, scholars generally agree that *person-centric* research studies are incapable of producing a conceptual framework that explains and predicts entrepreneurship as a unique set of empirical phenomena (Davidsson, 2015; Shane & Venkataraman, 2000). Roberts, et al. (2007) observe, “These studies—when taken as a whole—are inconclusive and often in conflict” (p. 4).

More than two-and-a-half decades earlier, Penrose (1989) had warned that human action has an essential *non-algorithmic* aspect. Various kinds of individuals and behavior patterns (Roberts, et al., 2007) having variability do exist. As Stevenson and Jarillo (1990) observe:

“[I]ndividuals have different . . . Desires [that] vary with current position and future expectations . . . Capabilities [that] vary depending upon innate skills, training, and the competitive environment . . . Perceptions of both desires and capabilities [that] are only loosely connected to reality.” (p. 23)

Such variability in individuals makes the entrepreneurial process, outcome/s, and causality linkages of the IO-nexus too relativistic and dependent on individuals (Stevenson & Jarillo, 1990) to be systematically studied. Too many variables exist in the ‘entrepreneur’ constituent of

the IO-nexus *per se*, making it difficult for entrepreneurship studies to derive systematic and meaningful conclusions. This leads Davidsson (2015) to conclude that entrepreneurial action and outcomes cannot be explained solely by the knowledge about the person.

2.6 ‘Opportunity’ in the IO-nexus

Where the enterprising *individual* element of the dualistic two-factor IO-nexus and his/her behavioral traits fail to measure up as the “initial condition[s]” (Bygrave, 1993, p. 255) that explain the entrepreneurial process, the recourse is to look at the opportunity dimension for clues on the defining characteristics of the entrepreneurial phenomenon. *Opportunity-oriented* research approach for developing a parsimonious general conceptual framework on entrepreneurship was suggested several decades ago by scholars like Drucker (1985a) and Vesper (1991). They argue that *opportunity* is the reason/cause for starting a venture, the *object* of *what* the entrepreneurs do (Gartner, 1988), and the *subject* of *how* a startup-venture conducts its entrepreneurial *process*. Examining the opportunity dimension can potentially help to accumulate insights for developing a conceptual framework to complement the IO-nexus notion as an *integrated* theory that describes and explains the *venture-outcome* as the *end* or *effect* to be achieved on an *a priori* basis and therefore the start-up entrepreneurial process needed to do so.

In this connection, several scholars (Alvarez & Barney, 2007; Buenstorf, 2007; Casson & Wadeson, 2007; McMullen, Lawrence, & Zoltan, 2007; Shane & Venkataraman, 2000; Shepherd, McMullen, & Jennings, 2007; Singh, 2001) also support the need to examine *opportunity* and understand its nature because it is the object pursued by the entrepreneur in the start-up process. They consider opportunity as a fundamental and critical aspect of the entrepreneurship phenomenon. As Short, Ketchen, and Ireland (2010) reason:

“Without an opportunity, there is no entrepreneurship. A potential entrepreneur can be immensely creative and hardworking, but without an opportunity to target with these characteristics, entrepreneurial activities cannot take place.” (p. 40)

In taking a positivist-realist view, Eckhardt and Shane (2010) venture even further to assert that “[o]pportunities cannot be exploited before they [are discovered to] exist” (p. 49).

2.6.1 Definitions of ‘opportunity’

It is sometimes possible to glean a peripheral understanding in regard opportunity’s intrinsic nature from reviewing seminal works on issues that may not relate directly to opportunity *per se*. The review of controversies in Section 2.4 among scholars over the alleged failure of IO-nexus to account for environmental forces is a case in point. The discussion highlighted that the *opportunity* element of the IO-nexus does intrinsically distinguish between those environmental forces as *antecedent* causes/sources that *provide* for the opportunity *per se* and orientate the entrepreneurial process, from *succedent* environmental counterparts that affect the entrepreneurial process as *moderators*.

A more systematic way to understand the nature of opportunity however would be to examine the *definitions* provided in extant literature. They can provide scholarly insights, benchmarks and terms of reference on opportunity’s (a) characteristics, and (b) nature in terms of its (i) ontological existence (i.e., *what* is opportunity, as well as *when*, *where*, and *why* it happens, (ii) epistemological processes of *how* it is formed (or comes into being) and exploited, and (iii) antecedents.

Table 2.1 provides a bird’s eye view on the definitions that underscore many of the extant views in literature regarding entrepreneurial opportunities (or venture-opportunities as referred to in this thesis). As evident in Table 2.1, the definitions are quite varied because of differences in their theoretical perspectives and the way opportunities have been observed in practice (Dimov, 2007b, p. 724), which give rise to important conceptual debates and a diversity of descriptions on the characteristics and nature of opportunities. However, a closer reading suggests that the views also overlap each other at times.

Table 2.1 – Examples of ‘entrepreneurial venture-opportunity’ definitions and views

S/N	Literature sources	Characteristics				Nature (antecedents, ontological existence, & epistemologies)			
		Favorability		Uncertainty	Novelty / innovative-ness	Market-relatedness	Antecedents	Existence & epistemology	
		Favorable	Unfavorable					Objectivist (‘exist,’ market imperfection)	Subjectivist (‘not exist,’ created)
1.	Shane (2000, pp. 451, citing Casson, 1982)	“Entrepreneurial opportunities are opportunities to bring into existence new goods, services, raw materials, and organizing methods that allow outputs <i>to be</i> sold at more than their cost of production” (Casson, 1982), where favorability is not a ‘given,’ as illustrated by four of eight case studies <i>not</i> generating profit and one <i>not</i> being feasible technologically (Shane, 2000, p. 455)		“ <i>to be</i> sold” (Shane, 2000, pp. 451, citing Casson, 1982)	“ <i>new</i> goods, services, raw materials, and organizing methods” (Casson, 1982)	“ <i>goods, services, raw materials, and organizing methods</i> ” (Shane, 2000, pp. 451, emphasis added)		“sold at more than their cost of production” (Casson, 1982)	
2.	Singh (2001)	“an entrepreneurial opportunity should be defined as a <i>feasible</i> , profit-seeking, <i>potential</i> venture that provides an innovative new product or service to the market, improves on an existing product/service, or imitates a profitable product/service in a less-than-saturated market (. . .) Being <i>feasible</i> means that the <i>potential</i> venture is <i>possible</i> (i.e., does not break the laws of physics), and the term <i>profit-seeking</i> allows us to define an entrepreneurial opportunity prior to venture founding and profitability.” (pp. 11, emphasis added)			“ <i>innovative new</i> product or service to the market, <i>improves</i> on an <i>existing</i> product/service” (pp. 11, emphasis added)	“ <i>product or service</i> to the <i>market</i> ” (pp. 11, emphasis added)		“ <i>less-than-saturated market</i> ” (pp. 11, emphasis added)	
3.	Dimov (2003)	“An opportunity can be broadly viewed as a <i>perceived possibility</i> of economic gain” (pp. 412, emphasis added)							<ul style="list-style-type: none">• Characterizes opportunities in terms of their epistemological context.• Two particular elements are<ul style="list-style-type: none">○ mental schemas (Gaglio 1997; Gaglio & Katz, 2001) (understanding of how external world works), and○ mental simulation + counterfactual thinking (which pertain to reflection over the past and future events (Baron 1999; Gaglio 2004).

S/N	Literature sources	Characteristics					Nature (antecedents, ontological existence, & epistemologies)		
		Favorability		Uncertainty	Novelty / innovative-ness	Market-relatedness	Antecedents	Existence & epistemology	
		Favorable	Unfavorable					Objectivist ('exist,' market imperfection)	Subjectivist ('not exist,' created)
4.	Eckhardt and Shane (2003)	<p>“[E]ntrepreneurial opportunities as situations in which new goods, services, raw materials, markets and organizing methods <i>can be</i> introduced through the formation of new means, ends, or means-ends relationships . . . have the <i>potential</i> to alter the terms of economic exchange . . . entrepreneurial decisions are creative decisions. That is, the entrepreneur constructs the means, the ends, or both.” (pp. 336, emphasis added)</p> <p>“Formulating a profitable conjecture about an opportunity is far from the trivial exercise of optimizing within existing means-ends frameworks because it requires forming expectations . . . <i>When</i> these <i>conjectures</i> prove <i>correct</i>, entrepreneurs earn entrepreneurial <i>profit</i>, but <i>when</i> they prove <i>incorrect</i>, entrepreneurs incur entrepreneurial <i>loss</i>” (pp. 339, emphasis added)</p>		<p>“<i>When</i> these <i>conjectures</i> prove <i>correct</i>, entrepreneurs earn entrepreneurial <i>profit</i>, but <i>when</i> they prove <i>incorrect</i>, entrepreneurs incur entrepreneurial <i>loss</i>” (pp. 339, emphasis added)</p>	<p>“<i>new</i> goods, services, raw materials, markets and organizing methods . . . through the formation of <i>new</i> means, ends, or means-ends relationships . . .” (pp. 336, emphasis added)</p>	<p>“<i>goods, services</i>, raw materials, <i>markets</i> and organizing methods” (pp. 336, emphasis added)</p>	<p>“<i>new means, ends, or means-ends relationships</i>” (pp. 336, with emphasis) “<i>means-ends frameworks</i>” (pp. 339, emphasis added)</p>	<p>“situations in which new goods, services, raw materials, markets and organizing methods <i>can be</i> introduced . . . to alter the terms of economic exchange” (pp. 336, emphasis added)</p>	<ul style="list-style-type: none"> • “Entrepreneurial discovery is the <i>perception</i> of a new means-ends framework” (pp. 338, emphasis added) • “entrepreneurial decisions are <i>creative decisions</i>. That is, the entrepreneur constructs the means, the ends, or both.” (pp. 336, emphasis added) • “Entrepreneurs bring new means-ends decision making frameworks into the price system by forming <i>perceptions</i> and <i>beliefs</i>” (pp. 338, emphasis added)
5.	Gaglio (2004)	<p>“ . . . ‘opportunity’ to mean the <i>chance</i> to introduce innovative (rather than imitative) goods, services, or processes to an industry or economic marketplace” (pp. 534, emphasis added)</p>			<p>“<i>innovative</i> (rather than imitative) goods, services, or processes” (pp. 534, emphasis added)</p>	<p>“<i>goods, services</i>, or <i>processes</i> to . . . <i>marketplace</i>” (pp. 534, emphasis added)</p>			

S/N	Literature sources	Characteristics					Nature (antecedents, ontological existence, & epistemologies)		
		Favorability		Uncertainty	Novelty / innovative-ness	Market-relatedness	Antecedents	Existence & epistemology	
		Favorable	Unfavorable					Objectivist ('exist,' market imperfection)	Subjectivist ('not exist,' created)
6.	Dutta & Crossan (2005)	“entrepreneurial opportunities as being a set of environmental conditions that lead to the introduction of one or more new products or services in the marketplace” (pp. 426, emphasis added)			“ <i>new</i> products or services in the market-place” (pp. 426, emphasis added)	“ <i>products or services</i> in the <i>marketplace</i> ” (pp. 426, emphasis added)	“a set of <i>environmental conditions</i> ” (pp. 426, emphasis added)	“ <i>environmental conditions</i> that <i>lead to</i> the introduction of one or more new products or services in the marketplace . . . <i>environment presents stimuli</i> ” (pp. 426 & 436, emphasis added)	“ <i>intuition</i> about the emerging future” (pp. 437, emphasis added) “ <i>emerging</i> business environment . . . seed of any entrepreneurial action . . . initial preconscious reflection by an individual . . . about a potential business idea . . . subject to a process of social construction . . . and enactment of multiple realities” (pp. 436, emphasis added)
								“process . . . [of] learning [about opportunity by the entrepreneur] has <i>both</i> a positivist/realist (or cognitive) side to it as well as an interpretive (or situated) side” (pp. 427, emphasis added)	
7.	Lee and Venkataraman (2006)	“opportunities contain the <i>possibility</i> for economic <i>gain</i> as well as the <i>possibility</i> for financial <i>loss</i> for the entrepreneur(s) pursuing the idea” (pp. 110, emphasis added)		“ <i>possibility</i> for economic <i>gain</i> as well as the <i>possibility</i> for financial <i>loss</i> ” (pp. 110, emphasis added)	“offer some <i>new</i> value to society . . . by introducing <i>innovative</i> and <i>novel</i> products or services” (pp. 110, emphasis added)	“ <i>products or services</i> ” (pp. 110, emphasis added)			
8.	Dimov (2007b)	“Opportunity, as a creative product in entrepreneurship, is the progress (idea + action) along a continuum ranging from an initial insight to a fully shaped idea about starting and operating a business” (p. 720)						“who would deny that a physical <i>reality exists</i> out there?” (pp. 724, emphasis added)	“Opportunities can be represented as a stream of continuously developed ideas, driven and shaped by one’s <i>social interaction</i> , creative insights, and action at each stage” (pp. 714, emphasis added)
								“the epistemological nature of opportunities . . . [is] the <i>interpretation</i> and meaning that people have of th[e] <i>underlying reality</i> ” (pp. 724, emphasis added)	

S/N	Literature sources	Characteristics					Nature (antecedents, ontological existence, & epistemologies)		
		Favorability		Uncertainty	Novelty / innovative-ness	Market-relatedness	Antecedents	Existence & epistemology	
		Favorable	Unfavorable					Objectivist ('exist,' market imperfection)	Subjectivist ('not exist,' created)
9.	Gartner, Shaver, and Liao (2008)	" <i>Opportunities are perceived as positive situations that are controllable ... must represent a desirable future state, involving growth or at least change; and the individual must believe it is possible to reach that state</i> " (pp. 304, italics in original text)			"involving ... at least <i>change</i> " (pp. 304, italics in original text)			"Objective realities external to individuals do affect whether these individuals notice, perceive, and act on them" (p. 312)	"Opportunities. . . a consequence of making sense of situations" (p. 302), and "interpretations about how entrepreneurs perceive themselves . . . [their] abilities and effort . . . rather than their external circumstances" (p. 311)
								"Opportunities . . . are both <i>created</i> and <i>discovered</i> : dependent on individual capabilities and efforts melded to <i>perceptions</i> of changing events and <i>circumstances</i> " (p. 312)	
10.	Alvarez & Barney (2010); Alvarez, Barney, & Anderson (2013)	"An opportunity exists whenever there are competitive <i>imperfections</i> in a factor or product market" (p. 559; p. 302)				"factor or product market" (p. 559; p. 302)	"exists whenever . . . competitive <i>imperfections</i> " (p. 559; p. 302)	"An opportunity exists whenever there are competitive <i>imperfections</i> in a factor or product market" (p. 559; p. 302)	"source of competitive imperfections" are "[e]nacted opportunities formed <i>endogenously</i> by entrepreneurs seeking to exploit [opportunities]" (2013, p. 305)
								"Actors engage in activities consistent with <i>prior beliefs</i> about the nature of the <i>opportunities</i> they <i>might face</i> Because there will often be a mismatch between an entrepreneur's initial beliefs and objective reality and/or the social constructions of others, to create and then exploit opportunities, actors must first act, wait for a response from their actions (usually from the market)" (Alvarez, Barney, & Anderson, 2013, p. 308)	
11.	Eckhardt and Shane (2010)	"entrepreneurial opportunities are situations in which goods and services <i>can be</i> sold for profit" (pp. 49, emphasis added)		" <i>can be</i> " (pp. 49, emphasis added)	" <i>new</i> means-ends framework" (pp. 51, emphasis added)	" <i>goods</i> and <i>services</i> " (pp. 49, emphasis added)	" <i>means-ends framework</i> " (pp. 51, emphasis added)		
12.	Grégoire, Shepherd, and Lambert (2010)	"entrepreneurial opportunities as projected courses of action to introduce (and <i>profit from</i>) new and/or improved supply-demand combinations . . . to address market failure" (pp. 117, with emphasis)			" <i>new</i> and/or <i>improved</i> supply-demand combinations" (pp. 117, with emphasis)	". . . to address <i>market failure</i> " (pp. 117, emphasis added)	" <i>supply-demand combinations</i> " (pp. 117, emphasis added)	"address <i>market failure</i> problems" (pp. 117, emphasis added)	
								"We thus advance that opportunity recognition rests on the subjective <i>perception</i> and interpretation of <i>objective realities</i> (e.g., market dynamics, new information, etc.)" (pp. 118, with emphasis)	

S/N	Literature sources	Characteristics					Nature (antecedents, ontological existence, & epistemologies)		
		Favorability		Uncertainty	Novelty / innovative-ness	Market-relatedness	Antecedents	Existence & epistemology	
		Favorable	Unfavorable					Objectivist ('exist,' market imperfection)	Subjectivist ('not exist,' created)
13.	Sarasvathy, Dew, Velamuri, and Venkataraman (2010)	<p>"our notion of an entrepreneurial opportunity consists of:</p> <p>"1. New idea/s or invention/s that <i>may or may not lead</i> to the achievement of one or more economic ends that become possible through those ideas or inventions; [and,]</p> <p>"2. <i>Beliefs</i> about things favorable to the achievement of those <i>possible</i> valuable ends; and,</p> <p>"3. Actions that generate and implement those ends through specific (imagined) new economic artifacts (the artifacts may be goods such as products and services, and/or entities such as firms and markets, and/or institutions such as standards and norms)" (pp. 79, emphasis added)</p>		" <i>may or may not lead . . . possible</i> valuable ends" (pp. 79, emphasis added)	" <i>New</i> idea/s or <i>invention/s . . . new</i> economic artifacts" (pp. 79, emphasis added)	" <i>products</i> and <i>services . . . markets</i> " (pp. 79, emphasis added)	"new <i>means . . . new ends</i> ")" (pp. 82, Table 4.1, emphasis added)		
14.	Short, Ketchen and Ireland (2010)	<p>"An opportunity is an idea or dream that is discovered or created by an entrepreneurial entity and that is revealed through analysis over time to be <i>potentially lucrative</i>" (pp. 55, emphasis added)</p>		<p>"revealed . . . over time to be <i>potentially lucrative</i>" (pp. 55, emphasis added)</p>				"An opportunity is an idea or dream that is <i>discovered</i> " (pp. 55, emphasis added)	"An opportunity is an idea or dream that is . . . <i>created</i> " (pp. 55, emphasis added)
								<p>" . . . <i>revealed</i> through analysis over time" (pp. 55, emphasis added)</p>	
15.	Wood and McKinley (2010)	<p>"entrepreneurial opportunity, which can be defined as a future situation that is both <i>desirable</i> and <i>feasible</i>" (pp. 68, emphasis added)</p>							<p>"opportunity production begins with the entrepreneur's <i>perception</i> of a possible opportunity in the form of an <i>idea</i> " (pp. 68, emphasis added, citing Dimov, ETP 2007a)</p> <p>"entrepreneur . . . begin a sensemaking process (Weick K. , 1995) . . . to clarify the <i>viability</i> of the envisioned future . . . outcome . . . is either <i>objectification</i> of the opportunity³ . . . or <i>abandonment</i> of the idea . . . as illusory" (pp. 68, 76, with emphasis)</p>

³ i.e., the objectification of opportunity *idea* as an external opportunity for the entrepreneur, or "the attribution of objective *reality* to an opportunity *idea* attribution, so that the idea begins to be seen as an entity *outside* the observer's mind" (Wood & McKinley, 2010, p. 70)

S/N	Literature sources	Characteristics					Nature (antecedents, ontological existence, & epistemologies)		
		Favorability		Uncertainty	Novelty / innovative-ness	Market-relatedness	Antecedents	Existence & epistemology	
		Favorable	Unfavorable					Objectivist ('exist,' market imperfection)	Subjectivist ('not exist,' created)
16.	Kornish and Ulrich (2011)	“ <i>opportunity</i> as an idea for an innovation that may have value after further investment of resources” (pp. 107, italics in original text, boldface added for emphasis)		“ <i>may have</i> value” (pp. 107, emphasis added)	“an <i>innovation</i> ” (pp. 107, emphasis added)				
17.	Shane (2012); Shane and Venkataraman (2000)	“Entrepreneurial opportunities are those situations in which new goods, services, raw materials, and organizing processes <i>can be</i> introduced and sold at greater than their cost of production” (pp. 15, italics added to indicate clarification about 'possibility,' not necessarily 'favorability'; pp. 220, emphasis added)		“ <i>can be</i> introduced and sold” (pp. 15, emphasis added; pp. 220, emphasis added)	“ <i>new</i> goods, services” (pp. 220, emphasis added)	“ <i>goods, services, raw materials, and organizing processes</i> ” (pp. 15, emphasis added; pp. 220, emphasis added)		“ <i>sold at greater than</i> . . . cost of production” (Shane & Venkataraman, 2000, pp. 220, emphasis added)	
18.	Ramoglou and Tsang (2016)	“entrepreneurial opportunity as the propensity of market demand to be actualized into <i>profits</i> through the introduction of novel products or services” (pp. 411, emphasis added)		“ <i>real</i> is broader than the domain of the <i>empirically observable</i> . Tendencies are unobservable and operate transfactly” (p. 413) “observations are theory laden and fallible” (p. 413) “Individuals can only believe (not know) that they have recognized entrepreneurial opportunities under uncertainty” (pp. 425, citing (McMullen, 2015: 657)	“introduction of <i>novel</i> products or services” (pp. 411, emphasis added) “products or services . . . new only for the target market” (p. 416)	“unmet or possible market demand” (p. 413)	“propensities that exist independently of potential entrepreneurs, in the form of unmet or possible market demand” (p. 413)	“The world <i>exists</i> objectively, albeit in various modes of being. The <i>real</i> is broader than the domain of the <i>empirically observable</i> . Tendencies are unobservable and operate transfactly” (p. 413)	

2.6.2 Characteristics of opportunity

The characteristics of entrepreneurial venture-opportunities cited in Table 2.1's definitions can generally be delineated into four key areas, namely favorability, uncertainty, market relatedness, and novelty.

2.6.2.1 Favorability

Davidsson (2015) takes great issue with the “connotation of favorability” (p. 682) that he alleges characterizes ‘opportunity.’ In fact, Davidsson (2015) advocates strongly against using “the label opportunity” (p. 682) as he believes it causes research work to lose clarity.

His contention however is disputable because there is a lack of unanimity on such a lexical connotation in literature. A random survey made of 18 definitions (among others) that Davidsson (2015) mentioned, only four or a 22% minority (see Table 2.1: 9, 12, and 15) associate ‘opportunity’ with ‘favorability.’ They used adjectives like “desirable” (Gartner, et al., 2008, p. 304), “profit from” (Grégoire, et al., 2010, p. 117), “desirable and feasible” (Wood & McKinley, 2010, p. 68), “actualized into profits” (Ramoglou & Tsang, 2016, p. 411).

Another three definitions (Table 2.1: 6, 8, and 10) are totally *silent* on whether opportunity is favorable (Alvarez & Barney, 2010; Alvarez, et al., 2013; Dimov, 2007b; Dutta & Crossan, 2005; Gaglio, 2004). The majority of the definitions (Table 2.1: 1, 2, 3, 4, 7, 11, 13, 14, 16, and 17) acknowledge the uncertainties of entrepreneurship and are *ambivalent* about the favorability of opportunity. They caveat entrepreneurial profitability or gain with adverb like ‘may be’ and passive verb like ‘can be.’ Hence favorability is not taken as a given, but “chance” (Gaglio, 2004, p. 534), mere perception (Dimov, 2003), “conjecture” (Eckhardt & Shane, 2003, p. 339), “possibility” (Eckhardt & Shane, 2010, p. 49; Kornish & Ulrich, 2011, p. 107; Lee & Venkataraman, 2006, p. 110; Sarasvathy, et al, 2010, p. 79; Shane, 2012, p. 15), “beliefs” (Sarasvathy et al., 2010, p. 79), and “potential” (Eckhardt & Shane, 2003, p. 336; Short, et al., 2010, p. 55; Singh, 2001). In other words, in the spirit of entrepreneurship, entrepreneurial

opportunities may eventually turn out to be “unfavorable” (Eckhardt & Shane, 2003, p. 339; Lee & Venkataraman, 2006, p. 110; Sarasvathy, et al., 2010, p. 79).

In conceding to Singh’s (2001) argument that *loss-making* is common in start-ups such as internet ventures, Shane (2012, p. 15) unequivocally states that the use of passive verb “can be” (Shane & Venkataraman, 2000, p. 220) simply suggests the *possibility* of entrepreneurial opportunities being profitable, but not so “always” (Shane, 2012, p. 15). If favorability is assured, there will be no recorded history of start-up failures in official statistics. Hence, in extant works ‘favorability’ is neither a natural connotation of ‘opportunity,’ nor a defining characteristic of entrepreneurial activity *per se*, contrary to what Davidsson (2015) would like researchers to agree. In a sense, the favorability connotation that Davidsson (2015) uses to justify his attempt to substitute venture (or business) ‘idea’ for the opportunity label appears to be a biased *retrospective* view of opportunity as only those that are successful. If opportunities connote favorability, then the *ex-post* outcome is assuredly favorable and the entrepreneur would not need to conduct the *ex-ante* IO-nexus entrepreneurial process of evaluating the viability of opportunity and validating its commercial desirability and technical feasibility. Moreover, the entrepreneur will have to wait for the project to translate itself favorably “before calling it ‘opportunity’” (Dimov, 2007b, p. 724). In truth, there are scholars like Ramoglou and Tsang (2016) who would take an even more radical view by associating failure with nonopportunity (and by implication, success, or favorability with opportunity):

“[F]ailure is a necessary and unavoidable state of the world when venturing into the domain of nonopportunity—no matter how hard one might try.” (pp. 421, emphasis added)

Citing Singh (2001), Ramoglou and Tsang (2016) go even further to say that:

“[A]bsence of anticipated profits might often be due to wrongdoings [e.g. ‘greed, stupidity, thoughtless bandwagon-climbing’ (Singh, 2001, p. 11)] or omissions [‘incompetence’ (Singh, 2001, p. 11)] in either the design or the execution stage” (pp. 426, emphasis added)

Other than equating ‘entrepreneurs’ to demigods, such radical views would mean that individuals need not play an active role in the IO-nexus of entrepreneurship, except always having the ability to identify favorable opportunities *ex-ante* and be the winning entrepreneurs through flawless execution *ex-post*. Moreover, these scholars neglect that entrepreneurship is about human action in the face of *uncertainty* (Dimov, 2007b; Knight, 1921; McMullen & Shepherd, 2006; Von Mises, 1949); and human *action* is the distinguishing step to the forming of opportunities (Dimov, 2007b), whether favorable or unfavorable. In practice, the entrepreneur must form and exploit his/her opportunity to be able to elicit information on its ultimate favorability. The information so gathered becomes part of the knowledge structures (Alvarez, et al., 2010), providing form and meaning to objectify the opportunity (Wood & McKinley, 2010), and helping the entrepreneur to decide the ‘next steps’ – whether to continue the entrepreneurial process beyond the start-up stage, or abandon the opportunity at hand (Alvarez, et al., 2010; Wood & McKinley, 2010). Entrepreneurial venture-opportunities are by nature uncertain and not necessarily favorable. Definitions of opportunity that connote favorability are tantamount to subsuming entrepreneurship under *certainty* condition, which is hardly the mainstream view in literature and practice.

2.6.2.2 Uncertainty

As described above, uncertainty is a characteristic of entrepreneurial opportunities that extant definitions mention (see Table 2.1: 4, 5, 7, 11, 13, 16, 17, and 18). It is for the reason of uncertainty that Ramoglou and Tsang (2016, p. 424) concur with McMullen’s (2015) claim, and assert opportunity existing only as a subjective “belief” of the entrepreneur and requires subsequent entrepreneurial *action* to prove or justify (Dimov, 2007b, p. 724; McMullen J. , 2015, p. 657). Entrepreneurial opportunities are subject to “chance” (Gaglio, 2004, p. 534), expressible as “conjectures” (Eckhardt & Shane, 2003, p. 339) and “observations [that are] theory laden and fallible” (Ramoglou & Tsang, 2016, p. 413). The “possibilit[ies]” (Lee & Venkataraman, 2006, p. 110) of “value” (Kornish & Ulrich, 2011, p. 107) “can be” (Eckhardt & Shane, 2010, p. 49; Shane, 2012, p. 15; Shane & Venkataraman, 2000, p. 220) unpredictable. The eventual value of an opportunity is “revealed through analysis over time” (Short, et al., 2010, p. 55), and “may

[be]” (Sarasvathy, et al., 2010, p. 49) profit or loss (Eckhardt & Shane, 2010; Lee & Venkataraman, 2006). Since the future is “to be” (Shane, 2000, p. 451) evolved (Alvarez, et al., 2010), entrepreneurial opportunity carries an element of uncertainty (which does not preclude the possibility that opportunity exists, nor mean that it must be favorable or unfavorable).

“[Uncertainty] cannot be reduced to an expression of calculable risk ... [which] follows that all entrepreneurial plans are blind in Campbell’s sense.” (Metcalf, 2009, p. 21).

Therefore, entrepreneurs will not be able to apply rational decision-making models (Kahneman, Slovic, & Tversky, 1982), but rely on biases and heuristics (Busenitz & Barney, 1997; Hayward, Shepherd, & Griffin, 2006; Kahneman, et al., 1982). Alternatively, they can adopt decision-making process that recognizes informational limits so that decisions that are more rational can surface over time (Alvarez, et al., 2010). These incremental decision-making approaches include bricolage (Baker & Nelson, 2005), effectuation (Sarasvathy, 2001), Bayesian updating (Bayes, 1764), and Linblomian science of “muddling through⁴” (Johnston, Low, & Wilson, 2012).

2.6.2.3 Novelty

Another defining characteristic of entrepreneurial venture-opportunities highlighted by the extant definitions (see Table 2.1: 1, 2, 4, 5, 6, 7, 9, 11, 12, 13, 16, 17, and 18) is that they connote:

- “change” (Gartner, et al., 2008, p. 304);
- “new” (Dutta & Crossan, 2005, p. 426; Eckhardt & Shane, 2010, p. 51; Grégoire, et al., 2010, p. 117; Lee & Venkataraman, 2006, p. 110);
- “innovati[ve]” (Gaglio C. , 2004, p. 534; Kornish & Ulrich, 2011, p. 107; Lee & Venkataraman, 2006, p. 110; Singh R. P., 2001, p. 11);
- “novel” (Lee & Venkataraman, 2006, p. 110);
- “invention” (Sarasvathy, et al., 2010, p. 79);

⁴ The theory postulates that the decision maker would not ordinarily find a body of theory precise enough to compare various consequences. Instead, he/she relies heavily on the *record of past experience*, and uses *small policy steps to predict the consequences of similar steps being extended into the future* (Johnston, Low, & Wilson, 2012, p. 718).

- “improve” (Grégoire, et al., 2010, p. 117; Singh, 2001, p. 11);
- “novel” and “new” (Ramoglou & Tsang, 2016, pp. 411, 416).

Entrepreneurial venture-opportunities allow the entrepreneur to generate or introduce *new* supply of “goods, services, raw materials, and ways of organizing” (Plummer, Haynie, & Godesiabo, 2007). The new supply is intended to fulfill new means-ends relationships and produce economic value (McMullen, Plummer, & Acs, 2007). The equation of ‘entrepreneurial opportunity’ to the generation of *new* supply of goods and services is also the consensual view among professors and doctoral students from the fields of economics and management who attended the workshop held at the Max Planck Institute of Economics in March of 2005 (McMullen, et al., 2007, pp. 274, 280).

As mentioned earlier, the notion of ‘newness’ includes the dimensions of *age* and *novelty* (Amason, Shrader, & Tompson, 2006, p. 144). Thus, ‘newness’ of supply is *new* not only in terms of age; it must also be *different* as a new category of product or service. Accordingly, ‘new’ refers to innovations or changes (in product/service) previously unheard, unknown, unforeseen, or unpredicted (Metcalf, 2009, pp. 10, 20, 21) in the marketplace, thereby opening up an entrepreneurial opportunity that is unproven and unrealized (Davidsson, 2004), and may not be favorable in terms of outcome.

(A).Types of ‘novelty/newness’ or innovation

Paradoxically, innovation is a characteristic of entrepreneurial venture-opportunities as much as it is a “locus of change that generates the opportunity” (Eckhardt & Shane, 2010, p. 55) through either supply or demand. Schumpeter (1934) and Drucker (1985b) refer to these supply and demand innovations as new combinations and sources of change respectively which are embedded in “means-ends relationships” (Shane & Venkataraman, 2000, p. 220).

Innovations on the *supply-side* include the following:

- (a) the creation of new products/services;

- (b) the creation/discovery of new production process/methods;
- (c) the creation/discovery of “factor” (Shane & Venkataraman, 2000, p. 220) or new raw materials supply;
- (d) the generation of new patterns or ways of organizing business/industry; and
- (e) any combination of the preceding four triggers otherwise referred to as Schumpeterian new combination.

From the perspective of Amason, et al. (2006), these kinds of innovations meet the dimension of *novelty*. To be truly ‘new’ in terms of the ‘age’ dimension as Amason, et al. (2006) propose, the innovations will have to be associated with new geographical markets. Schumpeter (1934) would consider them as innovations *per se* (Eckhardt & Shane, 2010, p. 55) in new market segments where they are hitherto unknown, or unheard of, unforeseen, or unpredicted (Metcalf, 2009, pp. 10, 20, 21).

From Davidsson’s (2004) viewpoint, expansion into new geographies (i.e., market internationalization) or niches (i.e., market segmentation) where the entrepreneur has not previously operated can be considered as innovative ways of pursuing entrepreneurial opportunities. Davidsson (2004) considers as innovative even those entrepreneurial opportunities that are:

“... ‘simple’ repetition of old success recipes in new contexts . . . [where they] may well be as revolutionary for the consumers and competitors in that [new] market as it was . . . [in] where the businesses originated.” (p. 10)

They “alter the terms of exchange” (Eckhardt & Shane, 2003, p. 336) and deliver (a) unique “business competitive advantages” (Bhave, 1994, p. 230), e.g., locational, product-market, and so on, and (b) market changes that benefits consumers (Davidsson, 2004), e.g. lower prices, better services, more choices, and so on.

(B). 'Imitation' versus 'innovation'

Although not expressly mentioned in extant works, the above discussion permits a *continuum* notion of newness or innovativeness to be defined as a characteristic of entrepreneurial opportunities. Hence, innovation/novelty can be truly *pioneering* in the Schumpeterian (1934) sense of a new combination and Metcalfe's (2009) sense of not being previously seen or heard. On the other hand, the newness or innovativeness of entrepreneurial opportunities can be 'diluted' by imitation so long as it possesses (a) the dimensions of age and novelty as Amason, et al. (2006) propose, or (b) novelty in the areas of business concept, production technology, and product itself⁵ as empirical studies have shown (Bhave, 1994, p. 230; Davidsson, 1986). In upholding the views of Aldrich & Martinez (2001), Davidsson (2004) explains, "No entrant is a perfect clone of an existing actor" (p. 10). All new activity and all changes are built *cumulatively* on the existing base of knowledge and practices (Metcalfe, 2009, p. 10). Ultimately, the litmus test is not based on 'imitation' *per se*. As Metcalfe (2009) points out, "[T]he crucial test is [whether a venture is] devoid of novelty from the wider system perspective" (p. 4).

2.6.2.4 Market-relatedness

Bhave (1994) found in his 1994 empirical study that "opportunities are recognized and evaluated by entrepreneurs with respect to markets" (p. 236). It is not surprising therefore that 11 of the 17 definitions in Table 2.1 associate 'opportunity' with goods and services relating to the marketplace:

- "factor or product" (Alvarez & Barney, 2010, p. 559; Alvarez, et al., 2013, p. 302);
- "products . . . services" (Dutta & Crossan, 2005, p. 426; Lee & Venkataraman, 2006, p. 110; Sarasvathy et al., 2010, p. 79);
- "product or service" (Singh, 2001, p. 11);

⁵ Bhave (1994) uses three 'parsimonious' core dimensions to define 'novelty': business concept, production technology, and product (p. 237).

- “goods, services, . . . processes” (Gaglio, 2004, p. 534; Shane, 2012, p. 15; Shane & Venkataraman, 2000, p. 220);
- “goods” (Eckhardt & Shane, 2003, p. 336);
- “goods and services” (Eckhardt & Shane, 2010, p. 49);
- “goods, services, raw materials” (Eckhardt & Shane, 2003, p. 336; Shane, 2000, p. 451; Shane & Venkataraman, 2000, p. 220);
- “market” (Alvarez & Barney, 2010, p. 559; Alvarez, et al., 2013, p. 302; Grégoire, et al., 2010, p. 117; Singh, 2001, p. 11);
- “markets” (Eckhardt & Shane, 2003, p. 336; Sarasvathy, et al., 2010, p. 79); and
- “marketplace” (Dutta & Crossan, 2005, p. 426; Gaglio, 2004, p. 534).

The association with the marketplace differentiates entrepreneurial opportunities from *non-market* initiatives such as crime, corruption (Baumol, 1990), as well as “humanitarian aid activities . . . and warfare” (Davidsson, 2004, p. 7). The latter activities are not considered as ‘entrepreneurial’ in the context of this thesis.

2.6.3 Nature of opportunity

The *nature* of opportunities refers not just to the epistemologies of forming and exploiting entrepreneurial venture-opportunities, which are covered by definitions in Table 2.1 and discussed in Section 2.6.3.1. It also includes the ontological antecedent conditions, which are discussed in the following section.

2.6.3.1 Antecedents of opportunity

Knowing the ontological antecedents of opportunity (i.e., the *where* and *when* it arises, and *what* it is) should be one of the most central features in entrepreneurship research (Drucker, 1985a; Vesper, 1991). It can help to elucidate the *mechanisms* (or *orientations* at the minimum) by which opportunities determine the venture-outcome on an *ex-ante* basis and “reliabl[y] guide”

(Azevedo, 2002) the entrepreneurs as they interact with opportunities in the entrepreneurial process of the IO-nexus.

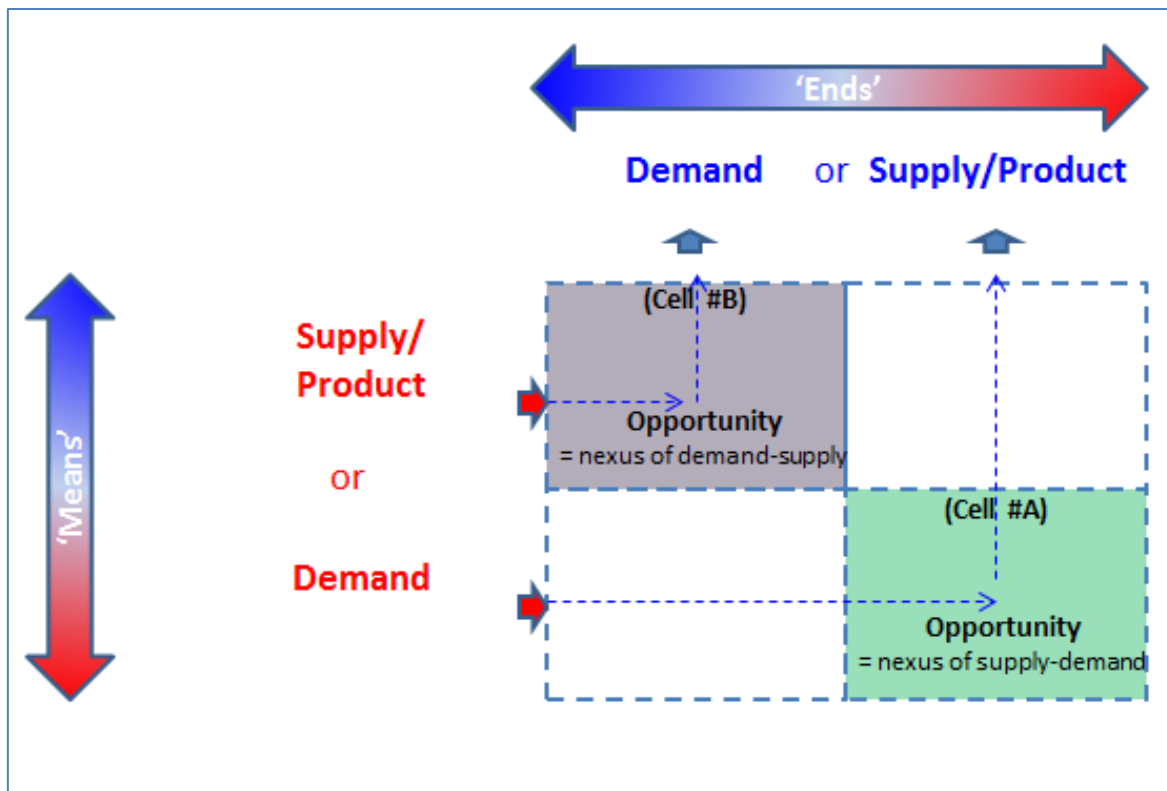
(A). Where does entrepreneurial venture-opportunity originate

The review of the extant definitions in Section 2.6.2.4 suggests that entrepreneurial opportunities are associated with the market. In fact, the marketplace is *where* entrepreneurial opportunities are inherently found and originate. The market association in turn allows the antecedents of entrepreneurial opportunities to be determined.

(B). What is entrepreneurial venture-opportunity

The association of entrepreneurial venture-opportunities with opportunities in the marketplace (or **market-opportunities**) means that they are invariably related to the market forces of *demand* and *supply*. Some of the definitions shown in Table 2.1 expressly include terms like “supply-demand combinations” (Grégoire, et al., 2010, p. 117) and “new and/or improved supply-demand combinations” (Grégoire, et al., 2010, p. 117). As Table 2.1:6 indicates, demand and supply forces represent the “set of environmental conditions” (Dutta & Crossan, 2005, p. 426) that cause “entrepreneurial opportunities [to] manifest themselves in a variety of different ways” (Eckhardt & Shane, 2010, p. 54), which resonates the view of Shane and Venkataraman (2000) that “entrepreneurial opportunities come in a variety of forms” (p. 220). In particular, demand and supply interrelate with each other in various means, ends, means-ends, or ends-means relationships (Eckhardt & Shane, 2003, pp. 336, 339; Eckhardt & Shane, 2010, p. 51; Kirzner, 1997; Sarasvathy, et al., 2010, pp. 82, Table 4.1), providing the bases for different *types* of *market-opportunity* as shown in Figure 2.2. Thus opportunity of the type represented by Cell #A features demand as the means applied to meet supply as the ends. Conversely, for the Cell #B type of opportunity, supply is the means by which demand is fulfilled as the ends.

Figure 2.2 – Opportunities as nexuses of demand and supply in ends-means and means-ends relationships



In essence, therefore, market-opportunities can be ontologically regarded as “combinations” (Grégoire, et al., 2010, p. 117) or *nexuses* of demand and supply:

“[C]onceiving entrepreneurial opportunities as new supply-demand combinations is not only relevant for defining entrepreneurial opportunities theoretically, but also has practical implications for efforts to draw meaningful mental connections among various stimuli and spur the identification of promising entrepreneurial ideas.” (Grégoire & Shepherd, 2012, p. 774)

Even though extant literature has not formally conceptualized as a notion, market-opportunity can be appropriately described as a demand-supply (**DS**) or supply-demand (**SD**) *nexus*. In particular, each market-opportunity is a *nexus* with its unique set of demand and supply antecedents interacting with each other in either *means-ends* or *ends-means relationship* – i.e., as

DS-nexus or SD-nexus. Seen in this light, we can further deduce *what* venture-opportunity is – it is market-opportunity formed and exploited at the venture level.

(C). When does entrepreneurial opportunity happen

Other than being associated with the marketplace, many scholars would also agree that entrepreneurial opportunities exist *when* there are competitive imperfections in the markets (Alvarez & Barney, 2010, p. 559; Alvarez, et al., 2013, pp. 302; Casson, 2010; Venkataraman, 1997). The general types of market imperfections include:

“... changing circumstances, chaos, confusion, inconsistencies, lags or leads, knowledge and information gaps, and a variety of other vacuums in an industry or market.”

(Timmons, 2004)

Based on historical experience (Davidsson, 2015), competitive imperfections reflect disequilibrium conditions (Arend, 2014; Schumpeter, 1934; Shane & Venkataraman, 2000) which arise from changes in demand or supply (see Figure 2.3). Such sources of change or *root-origins* of disequilibrium represent “the dynamics of market failure” (Grégoire, et al., 2010, p. 117). They can open up opportunities (Eckhardt & Shane, 2010). Hence, opportunities can be categorized on the basis of whether the root-origin that triggers them “exist on the demand or the supply side” (Eckhardt & Shane, 2010, p. 57).

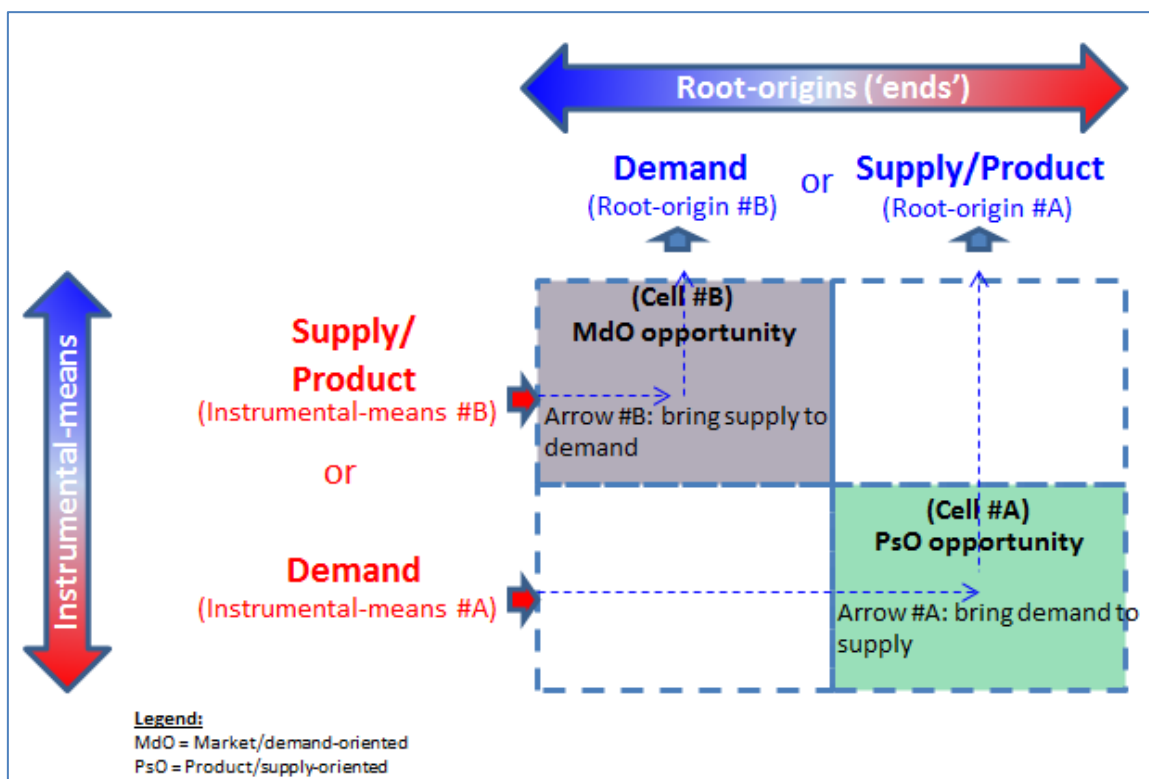
(1). Supply-side origin & orientation

In general, most discussions in entrepreneurship literature on entrepreneurial venture-opportunities revolve around *supply-side* triggers (Eckhardt & Shane, 2010, p. 57) as the root-origins of entrepreneurial opportunities. Some of the definitions in Table 2.1 may evidence this. As mentioned in Paragraph (A) of Section 2.6.2.3 above, supply-side root-origins of opportunities generally concern changes in products, production methods, raw materials and inputs, ways of organizing business/industry, or new knowledge (Drucker, 1985b; Schumpeter, 1934; Von Hippel, 1988), which trigger the prospect of opportunity. In the lineage of economics, such a situation is termed excess supply disequilibrium, which can be *actual*, say as in the case

of the *existing* market for real estate caused by a construction boom that happened in the past. It can also be *potential* and *emerging*, such as when the government decides to lift tariffs on imported cars despite protests by local automakers.

Short of destroying the inventory, excess supply disequilibrium can be cleared by bringing *demand* as the instrumental-means. Hence, opportunities triggered by supply-side root causes *per se* are *product/supply-oriented* (“**PsO**,” see Cell #A in Figure 2.2, which is reproduced in Figure 2.3) – the entrepreneurial *process*, or the process of the entrepreneur’s exchange relationships with consumers (the ‘other’ market actors) will be *oriented* towards bringing their demand to the product (see Figure 2.3: Arrow #A).

Figure 2.3 – Root-origin of opportunity as the ‘ends’ of entrepreneurial process



Isomorphically *supply*, which is the root-origin #A that triggered the market disequilibrium (and therefore *opportunity*) is also the *ends* or *venture-outcome* (see Figure 2.3) that the entrepreneurial process of a startup-venture is *oriented* towards when bringing demand as the means.

(2). Demand-side origin & orientation

As discernible in some of the extant definitions on opportunity in Table 2.1, market failure due to changes on the demand side alone can also generate entrepreneurial opportunities for start-up ventures in *existing* or *new* markets. Such demand-side causes or root-origins can arise from exogenous shifts in culture, perception, tastes, mood, market, demographic changes, or new knowledge (Drucker, 1985b; Kirzner, 1997; Schumpeter, 1934; Shane, 2003). An example is the shift in consumer preference for vegan food. The disequilibrium is one of excess demand, which opens up the prospect of opportunity for vegan products “to be marketed” (Dimov, 2003, p. 414) as the *instrumental-means* to satisfy *new* demand that has emerged. Such kind of opportunity *per se* is ‘market/demand-oriented’ (“**MdO**,” see Cell #B in Figure 2.2, reproduced in Figure 2.3). In this instance, it can be deduced that the entrepreneurial process to pursue such opportunities will be also be MdO, focused on bringing supply to meet the needs of consumers (the ‘other’ market actors) in the entrepreneur’s exchange relationships with them (see Figure 2.3: Arrow #B). Consequently, new *demand* being the root-origin #B that triggered market disequilibrium (and thus opportunity) is also the isomorphic *ends* or *venture-outcome* (see Figure 2.3) that *orientates* the entrepreneurial process of a startup-venture when bringing supply as the means.

(3). Root-origin as orientator of entrepreneurial process & a priori venture-outcome

Generalizing the deductions from the review of literature reported above, antecedent root-origins such as changes in the demand or the supply side (Eckhardt & Shane, 2010) can generate market-opportunities. They are *nexuses* of different combinations of demand and supply in *ends-means* and *means-ends* relationships which a startup-venture may pursue as entrepreneurial opportunities. As explained, the entrepreneurial process of bringing the *means* to fulfill/achieve the *ends* is *oriented* by the opportunity’s trigger or root-origin, which is *ipso facto* the isomorphic *end* or *venture-outcome*. In essence, the antecedent root-origin of a startup-venture’s particular type of entrepreneurial opportunity is the ends or venture-outcome, as well as the **defining orientator** and **unifying focus** of the entrepreneurial process. The fact that market *disequilibrium* or *failure* in classical economics theory can paradoxically be connected to *opportunity* in entrepreneurship theory is intuitive but not immediately or always obvious. However, as shall be explained in [Section 3.3.1](#), the paradoxical link has been an entrenched

view of the Chinese yin-yang duality philosophy as reflected in the word for *crisis* or ‘wei-ji’ (危機), which links together the contrasting concepts of *danger* (危) and opportunity (機).

(D). *Review summary*

The foregoing review of scholarly works on the *where*, *what*, and *when* of opportunity has helped this thesis to *deduce* the ontological nature of entrepreneurial opportunities as DS and SD nexuses. Each nexus represents a specific combination of demand and supply in ends-means or means-ends relationship oriented on an *a priori* basis by its root-origin which is the antecedent demand or supply. The *a priori* orientation provides guidance to the entrepreneurial process of the startup-venture when pursuing its opportunity within the market structure.

2.6.3.2 Existence, formation and exploitation

One of the key areas in Table 2.1 where the definitions differ in some instances, while overlap with each in other situations, relates to whether the ontological ‘existence’ of entrepreneurial opportunities is fundamentally objective or subjective. According to Gartner, Carter, and Hills (2003), the debates are between the objectivists and subjectivists on the ontological existence (‘being’) of opportunities. The goal in this section therefore is to review briefly the two contrasting theoretical positions on opportunity’s ontological existence (i.e., its ‘being’) in order to understand the three extant teleological approaches (Alvarez & Barney, 2007) that explain the epistemological process (i.e., ‘action’) of forming and exploiting opportunities.

It suffices to say that by aligning themselves with ontologically objectivist or subjectivist positions, the three teleological discourses (namely discovery/positivist-realist, constructionist, and evolutionary-realist) have evoked a number of important implications for research, teaching, and practice in the domain of entrepreneurship and related organizational studies. Table 2.2 taxonomizes the three teleological approaches according to their received ontological positions and epistemological explanations on the formation and exploitation of entrepreneurial opportunities (discovery, constructionist, and creation) to help appreciate the implications.

Table 2.2 – Different perspectives and terminologies of teleological theories on the ontology and epistemology of opportunity

Column 1	Column 2	Column 3	Column 4
Theoretical position regarding existence of reality	“Objectivist” (Wood & McKinley, 2010, p. 66): Objective reality exists independently	“Subjectivist” (Mahoney & Michael, 2005, p. 33): Reality exists in perception & interpretation, and generated by social construction & enactment as ‘outcome’ (Wood & McKinley, 2010, p. 67)	“Subjectivist” (Mahoney & Michael, 2005, p. 33): Reality exists in perception & interpretation, and generated by social construction & enactment as ‘outcome’ (Wood & McKinley, 2010, p. 67)
Type of entrepreneurial opportunities explained	<ul style="list-style-type: none"> • “discovery opportunities” (Alvarez, et al., 2010, pp. 25, 32; Shane, 2003; Venkataraman, 1997) • <u>Other names</u>: <ul style="list-style-type: none"> ○ “discovery” opportunities (Shane & Venkataraman, 2000, p. 220) ○ “recognition” opportunity (Sarasvathy, et al., 2010, p. 81) ○ “discovered opportunities” (Alvarez, et al., 2013, p. 305) 	<ul style="list-style-type: none"> • “constructionist opportunities” (Alvarez, et al., 2010, p. 34) • <u>Other names</u>: <ul style="list-style-type: none"> ○ “discovery” opportunity (Sarasvathy, et al., 2010, p. 81) 	<ul style="list-style-type: none"> • “creation opportunities” (Alvarez, et al., 2010, pp. 30, 36) • <u>Other names</u>: <ul style="list-style-type: none"> ○ “creation” opportunity (Sarasvathy, et al., 2010, p. 81) ○ “created opportunities” (Alvarez, et al., 2013, p. 308)
Fundamental philosophical view	<ul style="list-style-type: none"> • Opportunity as attributable to “temporal and spatial inefficiencies in an economy” (Shane & Venkataraman, 2000, pp. 219, referencing Kirzner, JEL1997) that exist objectively <i>ex-ante</i> and visible for discovery by knowledgeable or attuned entrepreneur (McMullen, Plummer, & Acs, 2007, p. 273) ○ <u>Proponents</u> (Wood & McKinley, 2010, p. 66): Hayek (1948), Kirzner (1979; 1997), Shane (2003), Shane & Venkataraman (2000) 	<ul style="list-style-type: none"> • Opportunity as socially constructed <i>ex nihilo</i> ‘result’ and inseparable from entrepreneur’s perception and subjective beliefs (Alvarez & Barney, 2007, p. 15; McMullen, et al., 2007, p. 273) ○ <u>Proponents</u> (Wood & McKinley, 2010, p. 67): Baker & Nelson (2005), Dimov (2007a), Felin & Zenger (2009), Gartner (1985), Giddens (1984), Mahoney & Michael (2005), Sarasvathy (2001) 	<ul style="list-style-type: none"> • Opportunity as individuals perceive, but (a) veracity tested against objective external potentially unobservable (Alvarez, et al., 2010, p. 24) or “latent” (Klein, 2008) reality, which is the collective social constructions of others (Alvarez, et al., 2013, p. 307), and (b) manifested by entrepreneurial <i>action</i> (Klein, 2008, pp. 182, italics in original text) ○ <u>Proponents</u>: Aldrich & Ruef (2006), Luksha (2008)
Teleological⁶ approach	Discovery (positivist-realist)	Constructionist	Evolutionary-realist
Corresponding ontological conception & terminologies used in extant works	<ul style="list-style-type: none"> • “discovery view” (Venkataraman, 2003, p. xi) • “realist” or “positivist” approach (Alvarez, Barney, & Young, Debates in entrepreneurship: Opportunity formation and implications for the field of entrepreneurship, 2010, pp. 23, 24; Dutta & Crossan, 2005, p. 426) ○ <u>Proponent</u>: Popper (1968) 	<ul style="list-style-type: none"> • “constructionist” approach (Alvarez, et al., 2010, pp. 23, 26), • “creative view” (Venkataraman, 2003, p. xi) ○ <u>Proponents</u>: Berger & Luckmann (1966), Kuhn (1970), Weick (1979) ○ <u>Exponents</u>: Baker & Nelson (2005), Dimov (2007a), Felin & Zenger 	<ul style="list-style-type: none"> • “evolutionary-realist” approach (Alvarez, et al., 2010, pp. 24, 28) ○ <u>Proponents</u>: Aldrich & Ruef (2006), Azevedo (1997), Azevedo (2002), Buenstorf (2007), Campbell (1974), McKelvey (1999) ○ Exponents: Wood & McKinley (2010)

⁶ Teleology (from the Greek word *telos*, which means ‘ends’ or ‘purpose’) is the philosophical study of nature by describing things in terms of their apparent purpose, directive principle, or goal.

Column 1	Column 2	Column 3	Column 4
	<ul style="list-style-type: none"> ○ <u>Exponents</u>: Eckhardt & Shane (2010), Kirzner (1997), Shane & Eckhardt (2005), Shane & Venkataraman (2000), Venkataraman (1997) • <u>Other names</u>: <ul style="list-style-type: none"> ○ Ranges– <ul style="list-style-type: none"> ▪ from “simple Kirznerian (1997) discovery process” (Shane, 2012, p. 15) of “optimization within <u>existing</u> means-ends frameworks (Kirzner, 1997)” (Shane & Venkataraman, 2000, p. 220), ▪ to “discovery of <u>new</u> means-ends relationships” (Shane & Venkataraman, 2000, p. 220) ○ means-ends relationships” (Shane & Venkataraman, 2000, p. 220) ○ “recognition” view (Sarasvathy, Dew, Velamuri, & Venkataraman, 2010, p. 81) 	<p>(2009), Gartner (1985), Mahoney & Michael (2005), Sarason, et al. (2006) Sarasvathy (2001), Sarasvathy, et al. (2010), Sarasvathy, Dew & Ventresca (2009)</p> <ul style="list-style-type: none"> • <u>Other names</u>: <ul style="list-style-type: none"> ○ “discovery” view (Sarasvathy, et al., 2010, p. 81) ○ “enactment approach” (Gartner, et al., 2003) 	<ul style="list-style-type: none"> • <u>Other names</u>: <ul style="list-style-type: none"> ○ “latent” construct (Klein, 2008, p. 182) ○ “creation” view (Sarasvathy, et al., 2010, p. 81)
Corresponding epistemological tradition & terminologies used in extant works	<ul style="list-style-type: none"> • “critical realist” (Alvarez, et al., 2010, pp. 23, 24) • “positivist” approach (Dutta & Crossan, 2005, p. 426) • “discovery process” (Alvarez, et al., 2013, p. 303) <ul style="list-style-type: none"> ○ <u>Proponents</u>: Eckhardt & Shane (2010), Kirzner (1997), Popper (1968), Shane (2003), Shane & Venkataraman (2000) • <u>Other name</u>: <ul style="list-style-type: none"> ○ “allocative” process (Hayek, 1945) 	<ul style="list-style-type: none"> • “constructionist” approach (Alvarez, et al., 2010, pp. 23, 26) <ul style="list-style-type: none"> ○ <u>Proponents</u>: Baker & Nelson (2005), Gartner (1985), Sarasvathy (2001) • <u>Other name</u>: <ul style="list-style-type: none"> ○ “creative view” (Venkataraman, 2003, p. xi) ○ “enactment process” (Alvarez, et al., 2013, p. 307; Weick, 1979) ○ “interpretive or social constructionist position” (Dutta & Crossan, 2005, p. 426) ○ “constructivist perspective” (Wood & McKinley, 2010, p. 66) ○ “structuration” perspective (Sarason et al., 2006) ○ “enactment approach” (Gartner, et al., 2003) ○ “discovery” process (Knight, 1921) 	<ul style="list-style-type: none"> • “evolutionary-realist” approach (Alvarez, et al., 2010, pp. 24, 28) • “creation process” (Alvarez, et al., 2013, p. 306) <ul style="list-style-type: none"> ○ <u>Proponents</u>: Aldrich & Ruef (2006), Azevedo (1997), Azevedo (2002), Buenstorf (2007), Campbell (1974), McKelvey (1999) • <u>Other name</u>: <ul style="list-style-type: none"> ○ “creation” process (Buchanan & Vanberg, 1991)
Examples of opportunities	<ul style="list-style-type: none"> • Simple acts of arbitraging to bring/push supply to demand, or franchising to bring/pull demand to supply • Markets already exist for deciding the prices and quantities 	<ul style="list-style-type: none"> • Demand-oriented: Bringing remedy for a known/existing illness (Sarasvathy, et al., 2010, p. 81). • Supply-oriented: SONY Walkman which was 	<ul style="list-style-type: none"> • Virgin Galactic development of commercial spacecraft that aims to provide suborbital spaceflights to space tourists⁷

⁷ See https://en.wikipedia.org/wiki/Virgin_Galactic

Column 1	Column 2	Column 3	Column 4
	for same goods that will come into existence in the future, e.g., various commodities markets, futures markets in currency, commodities, stock indexes, and so on (Venkataraman, 1997, p. 136)	introduced when demand has yet to be developed	<ul style="list-style-type: none"> Supply-oriented: Product invented/created, e.g., SONY Walkman, and Xerox's graphical user interface (Venkataraman & Sarasvathy, 2001, p. 9).

Table 2.2 reveals the diversity of labels (e.g., discovery, identification, recognition, and so on) found in research articles, sometimes even by the same scholars to describe ‘opportunities,’ their ontology (i.e., ‘existence’ or origin, and what they are), the epistemology (how they come into existence), and their role in the IO-nexus of interaction with the entrepreneurs as individuals.

One of the key reasons is the lack of consistency in the use of terminologies among the same authors, even when there is no need to do so. For instance, Alvarez and Barney (2013) observe that Venkataraman, et al. (2012) have used the terms “found” to describe “discover,” and “made” to describe “creation” processes in writings they published on different occasions (Venkataraman, 1997; Venkataraman, 2003; Venkataraman, Sarasvathy, Dew, & Forster, 2012). In short, one of the reasons for the inconsistencies in literature is because different words have been used to describe different dimensions of entrepreneurship, while at the same time, different terms have also been used to describe the same dimensions.

To address the inconsistencies and for the sake of parsimony, this thesis will endeavor to use labels that are first proposed by Venkataraman, or intuitively easier to understand.

Thus ‘positivist-realist’ or “discovery” view (Venkataraman, 2003, p. xi) will be used instead of “recognition” (Sarasvathy, et al., 2010, p. 81) to describe discovery opportunities involving the “simple Kirznerian (1997) discovery process” (Shane, 2012, p. 15). Similarly, “constructionist” approach (Alvarez, et al., 2010, pp. 23, 26) instead of “constructivist perspective” (Wood & McKinley, 2010, p. 66) will describe the formation of constructionist opportunities, and “evolutionary-realist approach” (Alvarez, et al., 2010, pp. 24, 28) for creation opportunities.

The more fundamental reason for the diversity in terminologies is the differences in philosophical or theoretical positions among researchers on the phenomenon of entrepreneurial opportunities (Gartner, et al., 2003). There are also researchers who have presented seminal works without stating or being aware of the received paradigms. However manifested, these

differences have limited the progress of research “on the role of [entrepreneurial] opportunities and their interaction with entrepreneurs in the IO-nexus” (Davidsson, 2015, pp. 674, 675).

(A). Discovery (positivist-realist) approach on opportunities

The position taken by the positivist-realists (Alvarez, et al., 2010; Dutta & Crossan, 2005) on the epistemological formation of opportunities reflects a “discovery view of entrepreneurship” (Venkataraman, 2003, p. xi), also referred to as the “discovery” approach (Shane & Venkataraman, 2000, p. 220). The ontology in regard the existence of opportunities is premised on the *objectivist* theoretical tradition (Wood & McKinley, 2010). The discovery approach has also been referred to as the IO-nexus notion, “recognition”⁸ view (Sarasvathy, et al., 2010, p. 81), and “allocative” view (Sarasvathy, et al., 2010, p. 82). It is more widely adopted among North American researchers (Dutta & Crossan, 2005; Venkataraman, et al., 2012). In the context of this paper, the epistemological assumptions of *recognition* opportunities are the same as *discovery* opportunities. Hence, *recognition opportunities will not be considered separately* in this thesis.

The positivists/realists (Eckhardt & Shane, 2010; Shane & Eckhardt, 2005; Shane & Venkataraman, 2000; Venkataraman, 1997) suggest that opportunities exist *independent* of the entrepreneur and are observable in the external world, waiting to be discovered (Dutta & Crossan, 2005; Hayek, 1948; Hmieleski & Baron, 2008; Kirzner, 1979; Shane, 2003; Shane & Venkataraman, 2000). This objectivist attribution means that opportunities with the most economic potential are “objective construct[s] visible to . . . the knowledgeable and attuned entrepreneur” (McMullen, et al., 2007, p. 273) having the “entrepreneurial alertness” (Kirzner, 1973, p. 67; Shane & Delmar, 2004) to discover and claim them (Casson, 1982; Gaglio & Katz, 2001; Kirzner, 1997; Shane & Eckhardt, 2005).

Built on the work of “Austrian” economists (Hayek, 1945; Kirzner, 1973; Von Mises, 1949), the discovery view is linked to the Kirznerian process of discovering opportunities under market

⁸ Authors like Miller (2007) and Sarasvathy (2010) have used the label ‘recognition’ opportunities for situations when there is a mismatch between prices in separate markets; hence, they associate recognition opportunities with ‘entrepreneurial arbitrage.’

disequilibrium conditions by the alert entrepreneurs who act as replicative arbitrageur (Levie & Autio, 2008), or price adjusters, in the marketplace. They work within “*existing* means-ends relationships” (Shane, 2012, pp. 17, emphasis added). In so asserting, the discovery view limits itself to opportunities that exist *ex-ante*, and therefore can be discovered, identified, or recognized (Frederiks, 2015). It assumes markets with ‘imperfect information’ (Kirzner I. , 1973; Von Mises, 1949), which has its root in “Austrian” economics, and therefore differs from the views of traditional neoclassical economists (Frederiks, 2015). The entrepreneurs capitalize on their prior knowledge (Shane, 2000; Venkataraman, 1997) regarding asymmetries or gaps in market information (Dutta & Crossan, 2005) to discover, evaluate, form, and exploit opportunities that exist. The epistemology is often described as an **EDE** process (see [Section 2.2](#)), sometimes also referred to as the “allocative” process (Sarasvathy, et al., 2010, pp. 81, 82).

In the discovery conception, information exists regarding the opportunities because they can be seen and observed “rather obviously” (Sarasvathy, et al., 2010, p. 81). Discovery opportunities “have material properties and defined parameters that exist independent of the perceptions of individuals” (Alvarez, et al., 2010, p. 25). Information on the discovery opportunities is objectively available in the “external environment” (Dutta & Crossan, 2005, p. 426), and manifest in existing physical and social artifacts, such as technologies, routines, operating procedures, processes (Alvarez, et al., 2013, pp. 305, Table 1). This means that the discovery approach operates in a ‘risk’ context where data can be collected to aid decisions in a risk-based context (Hmieleski & Baron, 2008). That discovery opportunities (Alvarez & Barney, 2007; Shane, 2003) may yet to be observed or discovered does not deny their existence “out there” (Grégoire, et al., 2010, p. 117). It only suggests that no “attuned” entrepreneur (McMullen, et al., 2007, p. 273) has gathered sufficient information to become aware of their existence, or to “*notice without search* opportunities that have hitherto been overlooked” (Kirzner, 1979, pp. 48, italics added for emphasis).

Based on the objectivist stance, discovery opportunity in its ‘strictest form’ would present itself for arbitrage (**arbitrageable discovery opportunity**) because of “price misalignments” (Shane, 2000, p. 449) caused by information asymmetries in the existing marketplace. Arbitraging activities can be found in wholesale or retail markets for physical goods and services (e.g., real

estate market, and various commodities markets), as well as financial products (like currency, commodities, stock indexes, futures, swaps, derivatives, and so on) “that will come into existence in the future” (Venkataraman, 1997, pp. 136, Note 1).

Franchising is another example, which has the objective of pulling demand to supply. In both the instances of arbitraging and franchising, discovery opportunity is reduced to a “singular phenomenon . . . that is the same for all individuals” (Sarason, et al., 2006, p. 293), and can be discovered by individuals with entrepreneurially alertness (Kirzner, 1973), possessing the informational and knowledge advantage (Hayek, 1945; Shane, 2000), and needing achievement (McClelland, 1961). While “profits” (Shane, 2000, p. 449) can be generated for the alert entrepreneurs, the acts of arbitraging and franchising are regarded as low-level entrepreneurship (Schumpeter, 1934) in extant works. Alfred Marshall (1920) for instance excludes wholesale and retail activities from his formal analysis of supply and demand as he considers them unentrepreneurial.

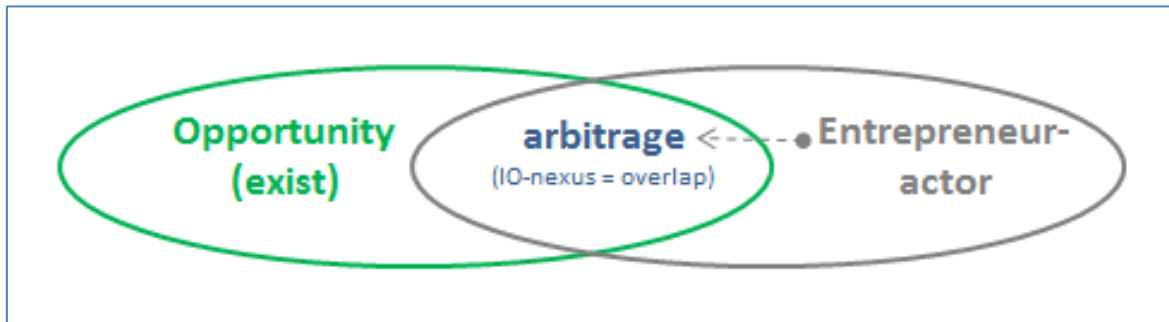
In any case, the objectivist attribution of opportunity as a ‘given’ relegates the “nexus of individual and opportunity” (Venkataraman, et al., 2012, p. 22) to a mere ‘overlap’ of entrepreneur and opportunity as two separate and distinct constructs (Sarason, Dean, & Dillard, 2006), which reflects the spirit of ‘dualism’ rather than ‘duality’ as will be described in Section 3.1. Sarason, et al. (2006) observe:

“[Rather than] represent[ing] the two as intricately interlaced with their attributes being a function of the effect of one on the other, . . . [the traditional objectivist views of] Shane and Venkataraman (2000) imply that opportunities are separate and distinct from the individual.” (p. 293)

Arbitrage is the action that occurs at the point where the two overlap (see Figure 2.4). With the objectivist stance of discovery opportunity as being an object that exist independently *talis qualis*, the entrepreneur is then merely an arbitrageur with **no** causal or formative **role** to play as the individual element in the process of the IO-nexus.

“Entrepreneurs discover opportunities that preexist independently of entrepreneurs as empirically undiscovered entities.” (Ramoglou & Tsang, 2016, p. 413)

Figure 2.4 – IO-nexus of discovery approach



(B). Constructionist approach on opportunities

At the other end is the “constructionist” approach (Alvarez, et al., 2010, pp. 23, 26) to the ontology of opportunities, which also provides teleological explanations on the epistemological formation, and exploitation of opportunities. It is also variously referred to as the “constructivist perspective” (Wood & McKinley, 2010, p. 66), “interpretive or social constructionist position” (Dutta & Crossan, 2005, p. 426), “creative view” (Venkataraman, 2003, p. xi), “creation” process (Sarasvathy, et al., 2010, pp. 81, 82), and “structuration view” (Giddens, 1984; Sarason, et al., 2006, p. 286). The core logic of the constructionist approach is premised on the lesser-known *subjectivist* position (Mahoney & Michael, 2005), which is more prevalent in the European research (Dutta & Crossan, 2005; Venkataraman, et al., 2012), such as the work by Levenhagen, Porac and Thomas (1993).

Where the objectivist discovery approach “is unable to illuminate” (Wood & McKinley, 2010, p. 67), the “constructionists” (Baker & Nelson, 2005; Dimov, 2007a; Felin & Zenger, 2009; Gartner, 1985; Mahoney & Michael, 2005; Sarasvathy, 2001) provide as an alternative the notion of “constructionist opportunities” (Alvarez & Barney, 2007, p. 34). These are social products generated as “self-fulfilling prophec[ies]” (Alvarez, et al., 2010, p. 27) by the enactments of entrepreneurs within social structures (Alvarez, et al., 2010). The social constructions of the

constructionist entrepreneurs reflect their cognition, perceptual and reasoning skills (Katz & Shepherd, 2003), as well as understanding, interpretations, and beliefs about environmental forces (Alvarez & Barney, 2007; Alvarez, et al., 2010; Baker & Nelson, 2005; Dutta & Crossan, 2005, p. 426; McMullen & Shepherd, 2006; Sarasvathy, et al., 2010). It is therefore impossible for opportunities to exist independently *a priori*, or be separated from the individual (Berger & Luckmann, 1976; Companys & McMullen, 2007; Dimov, 2007a; Hmieleski & Baron, 2008; Kuhn, 1970; McMullen, et al., 2007; Sarason, et al., 2006; Weick, 1979).

Indeed, the constructionist entrepreneurs are:

“[Individuals with] the creative abilities and resources to influence their environment and facilitate the exploitation of the new products, processes, services, and market.”
(Grégoire, et al., 2010, p. 117).

They differ from discovery entrepreneurs who are simply knowledgeable or attuned individuals. Being creative however, the constructionist entrepreneurs can be vulnerable to “over-confidence bias” (Alvarez, et al., 2010, p. 28) when they socially construct opportunities into self-fulfilling prophecies. In this connection, the specific mechanisms of entrepreneurial decision and action may involve cognitive heuristics (whether mental simulations⁹ or counterfactual thinking¹⁰) to determine the meaning of environmental stimuli, the viability of the subjective envisioned future (Weick, 1995), and the subsequent behaviors to be taken (Gaglio, 1997; Gaglio, 2004). The decision making process is characteristically “incremental, inductive, and intuitive” (Alvarez, et al., 2013, pp. 305, Table 1), producing new contextual information that then allows the entrepreneur to mold and effectuate his/her actions (Baker & Nelson, 2005; Sarasvathy, 2001) and construct opportunity as a “self-fulfilling prophecy” (Alvarez, et al., 2010, p. 27).

However, in the context of the IO-nexus, the problem with the constructionist conception is that it does not directly acknowledge the influential role of opportunity in the nexus of

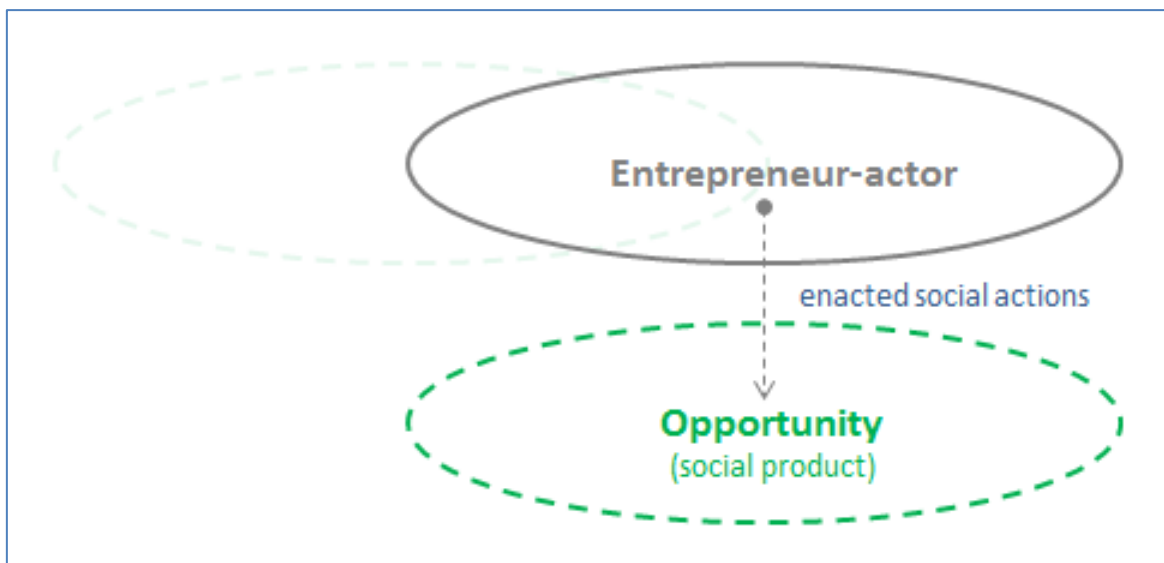
⁹ Mental simulations are defined as imitative cognitive constructions or representations of an event or series of events based on a causal sequence of successive interdependent actions (Sanna, 2000; Taylor, Pham, Rivkin, & Armor, 1998).

¹⁰ Counterfactual thinking quite simply refers to thinking in a way that is contrary to existing facts (Roese, 1997).

entrepreneurial process with the individual entrepreneur. The constructionists attribute the existence of opportunity on an *ex-post* basis to the constructive enactment of the entrepreneur. Constructionist opportunity “can only be *retrospectively* recognized” (Dutta & Crossan, 2005, pp. 429, emphasis added), articulated, and explained (Dimov, 2011, p. 60). There is therefore **no nexus** in the constructionist universe between the entrepreneur and opportunity as Figure 2.5 illustrates, as the latter is a socially constructed artefact from the entrepreneur’s enactment within social structures.

“Opportunities do not exist until they are created endogenously by entrepreneurs.”
(Ramoglou & Tsang, 2016, p. 413)

Figure 2.5 – Opportunity as enacted social product in constructionist approach



Despite the apparent subjectivist assertion, the constructionist approach *paradoxically* contains and does require objectivist attributions to make itself logical as a concept to explain the ontology and epistemology of opportunity. Alvarez, et al. (2010) clarify that:

“[The constructionist view] pre-supposes a commitment to a minimal logic – which is, that a current market exists, but is then redefined by the enactment of the new opportunity as the [constructionist] opportunity is tested against this existing market through human action” (p. 28).

In other words, interpretations in the context of constructionist conception pre-suppose sensemaking (Weick, 1995) of “external stimuli” (Wood & McKinley, 2010, p. 67), “existing realit[ies]” (Alvarez, et al., 2010, p. 27), “objective condition, objects, and events” (Wood & McKinley, 2010, p. 67), or “prompting realit[ies]” (Gaglio, 2004, p. 544). These realities stem from the entrepreneurs’ environment, which reflect “where” they are, and “what” resources they have (Alvarez, et al., 2010, p. 27; Baker & Nelson, 2005). The entrepreneurs must “ponder what ‘opportunities’ they might ‘face’ and whether they have the resources to ‘exploit’ them” (Davidsson, 2015, pp. 680, Table 3:9). Their perceptions and interpretations of possible opportunities in current markets can begin in the form of ideas (Dimov, 2007a), and are then redefined in the process of enacting, designing, and “test[ing] the veracity of their perceptions” (Alvarez & Barney, 2007, p. 15).

While the constructionists try to garner coherence for their subjectivist stance by arguing that the ‘market’ is itself a socially constructed entity (Alvarez, et al., 2010), the social constructions in the market include actions of *other* individuals who exist. These actions are presented as objective and exogenous to the entrepreneur through reciprocal interactions and affirmations within the context of an encompassing social structure called ‘the market’ (Wood & McKinley, 2010, p. 70). Such reciprocity in the interactions between human actors and social structure are rooted in the ‘duality concept’ of structuration theory, which has become part of a growing movement in sociology and organization theory (Sarason, et al., 2006, p. 290) such as the works of Dillard, Rigsby and Goodman (2004) and Reed (1997).

As the constructionist entrepreneurs enact and interact with the social environment, they become “an integral part of opportunity emergence as they invent parts of what they believe to be viable” (Weick, 1979; Wood & McKinley, 2010, p. 70). In the structuration view (Giddens, 1984), the entrepreneurs and their notions of viability are both enabled and constrained (coincidentally a dialectic but harmonious *yin-yang* perspective as shall be explained in Chapter 3). However, they are normalized within the context of the objective social structure (Sarason, et al., 2006, p. 290; Wood & McKinley, 2010, p. 70). The objectivist “one side” (Sarasvathy, et al., 2010, p. 81) of constructionist opportunity (either supply or demand) exists, and is known and observable. The subjectivist “emerge[nt] . . . part” (Weick, 1979; Wood & McKinley, 2010, p. 70) of opportunity

(either demand or supply) that is believed to be viable and can be invented or “accomplished with available resources within their environment” (Alvarez, et al., 2010, p. 27) is the other “non-existent side” (Sarasvathy, et al., 2010, p. 81). It is “unknown” (Sarasvathy, et al., 2010, pp. 82, see also Table 4.1 under "discovery opportunity"), tacit, not observable, and yet do exist, so that enactment ‘action’ is required. For constructionist opportunity to emerge, that non-existent side has to be enacted and constructed by the entrepreneurs based on their subjective perception and interpretation of the objective ‘being’ environment, the “one side [that] exists” (Sarasvathy, et al., 2010, p. 81). In a sense, this objectivist existent side of the opportunity which is known and observable helps define the context and viability of that subjectivist “[other] non-existent side” (Sarasvathy, et al., 2010, p. 81) which is unknown or unobservable. Such a situation requires the constructionist entrepreneurs to manage both risk (of things known) and uncertainty (of things unknown) in their entrepreneurial process.

From a ‘business’ standpoint, the constructionist notion of opportunity has to do with market environment which is in part existing, and in part new or “latent” (Sarasvathy, et al., 2010, p. 81) and in need of development. As Alvarez, et al. (2010, p. 27) explain:

“[T]he entrepreneur’s goal is to construct, deconstruct, and reconstruct an existing reality so as to form a new reality and thus opportunity.” (p. 27)

Roberts, et al. (2007, p. 6), and Stevenson (2006, p. 4) add:

“[T]he entrepreneur is not necessarily concerned with breaking new ground; opportunity can also be found in a new mix of old ideas or in the creative application of traditional approaches. We do observe, however, that firms tend to look for opportunities where their resources are.” (p. 6; p. 4)

In short, the constructionist tradition is a “cognitive approach to entrepreneurship” (Katz & Shepherd, 2003, p. 6). An example is the introduction of SONY Walkman even before demand was developed. Finding a remedy for a known illness is an example where demand exists but the antidote product has to be discovered (Sarasvathy, et al., 2010, p. 81). Another example where

demand exists but supply has to be discovered is Ron Popeil's inventions of kitchen devices that are more convenient and health conscious (Venkataraman & Sarasvathy, 2001, p. 8).

In summary, constructionist approach is commonly presented in extant entrepreneurship theories as having a subjectivist lens. Paradoxically, its conception of opportunity also requires the objectivist attribution of *a priori* external stimuli as prompting realities to validate the subjective perceptions and actions of the entrepreneur (Alvarez, et al., 2010, p. 30). If the constructionist conception holds a strict subjectivist stance by denying the co-existence of objectivist attributions, the IO-nexus will be irrelevant as a notion as 'opportunity' ostensibly will have no objective role to play.

(C). Evolutionary-realist approach on creation opportunities

While the third evolutionary-realist approach appears to be an attempt at reconciling the contrasting and mutually exclusive theoretical positions of the objectivists and subjectivists, it "builds on many aspects of [the] constructionist perspective" (Alvarez, et al., 2013, p. 307), including the social constructionist view of action. The ontological premise of the evolutionary-realists is therefore fundamentally *subjectivist*, meaning that reality is what the individual perceives mind-dependently and needs to be socially constructed. Yet paradoxically, there *also* exists an objective and external reality independent of the individual's perception, albeit potentially unobservable (Alvarez & Barney, 2010), that plays several roles. It selects and edits his/her beliefs and perceptions (Alvarez, et al., 2010), as well as tests the veracity of his/her social constructions (Alvarez, et al., 2013, p. 307). As an illustration, Alvarez, et al. (2013) assert that 'money' is real, but its reality "becomes socially known because it derives its collective meaning" (p. 307) from being socially constructed. Thus evolutionary-realism, despite being subjectivist, does not preclude the possibility of "creation opportunities" (Alvarez, et al., 2010, pp. 30, 36) existing on an *a priori* basis, only that it may be unobservable or "latent" (Klein, 2008, p. 182). In this view, "opportunities cannot be understood until they exist" (Alvarez & Barney, 2007, p. 15; Alvarez, et al., 2013, p. 308; Berger & Luckmann, 1966; Weick, 1979) because they are yet unknown. To manifest or make known the opportunity, the agency of entrepreneurs is needed.

Since opportunity is yet unknown and has to be perceived, the creation entrepreneurs are unable to gather information like the discovery entrepreneurs to assess the probability of outcomes for their actions. Feasibility studies and business plans to form and exploit creation opportunities cannot be drawn up in a meaningful way, and the creation entrepreneur must cope with ambiguity, uncertainty, and unpredictability in the markets where they operate (Hmieleski & Baron, 2008).

Given the subjectivist view of opportunity as a phenomenon that is yet to exist (although as reasoned, it may exist but merely unobservable and therefore unknown and deemed by the individual as ‘not’ existing), the creation entrepreneurs cannot see “the end from the beginning” (Alvarez, et al., 2010, p. 30). They must first rely on their perspective of knowledge, perceptions, and interpretive understanding to act, just like their constructionist entrepreneur-counterparts.

At the outset, the actions and associated trial-and-error variations¹¹ taken by the creation entrepreneurs to create and then exploit opportunities can be “blind, intentional, or myopic” (Alvarez, et al., 2013, p. 307). Specific action mechanisms that guide intentional and myopic variations actions can include bricolage¹² (Baker & Nelson, 2005), improvisation (Baker, et al., 2003; Hmieleski & Corbett, 2008; Vera & Crossan, 2005), creative imagination (Lachmann, 1986), and effectuation (Read, Song, & Smit, 2009; Sarasvathy, 2001).

The mechanisms of action-reaction that characterize the decision-making process are “incremental, inductive, and intuitive” (Alvarez, et al., 2013, pp. 305’s Table 1). Once action commences, the creation entrepreneurs will wait for a response “usually from the market” (Alvarez, et al., 2013, p. 308; Alvarez, et al., 2010, p. 30), and then adjust their beliefs and act again (Weick, 1979).

¹¹ According to Alvarez, et al. (2013, p. 307), variations can be regarded as blind, intentional, or myopic departures from a known routine or tradition. *Blind variations* can arise from accidents, chance, conflict, and luck. *Intentional variation* can happen when individuals or firms generate alternatives and seek solutions to problems. Since intentional variations rarely anticipate all consequences as bounded rationality implies, they can be *myopic* in nature.

¹² Bricolage as a solution is the outcome or “an emergent construction” (Weinstein & Weinstein, 1991, p. 161) of the bricoleur’s method. It changes and takes new forms over time as different tools, methods, and techniques are added to the puzzle (Denzin & Lincoln, 1994a, p. 2).

In this connection, the evolutionary-realists consider the market a socially constructed entity (Alvarez, et al., 2010) that exists as an objective external reality (an inadvertent objectivist attribution) and ultimate criteria (McKelvey, 1999) to cross-validate the actions and social constructions of the creation entrepreneurs. Referring to the epistemological approach of Campbell's (1960; 1974) evolutionary realism, Alvarez, et al. (2013) identify two bases for the entrepreneurs to test and cross-validate the veracity of their "perception" (Alvarez & Barney, 2007, p. 15) and their social constructions. Analogous to "gravity [that] tests the socially constructed belief that one can fly without any assistance" (Alvarez, et al., 2013, p. 308), the first basis for cross-validation is *supply-related* validation or technical feasibility assessment of a product idea. The second cross-validation basis is *market demand* validation, which represents the collective or aggregated social constructions of others (Azevedo, 2002; Campbell, 1960; McKelvey, 1999). Market demand determines the commercial viability of the opportunity. The social cross-validations help gather "new context specific information where none previously existed" (Alvarez, et al., 2013, pp. 305, Table 1), which help to select for and against their actions (Alvarez, Barney, & Young, 2010, p. 28). The creation entrepreneurs adjust their beliefs, vary their actions, and then act again (Alvarez, et al., 2013, p. 308; Weick, 1979) culminating in the emergence of the opportunity. The history of technology entrepreneurship is replete with solutions looking for demand.

The market reaction and social constructions of others guide the creation entrepreneurs in making variations, and select for or against the actions taken by the entrepreneur (Alvarez, et al., 2010). They serve as the objective external reality and ultimate criteria that test and validate the opportunities as they emerge from social construction (Alvarez, et al., 2010; McKelvey, 1999).

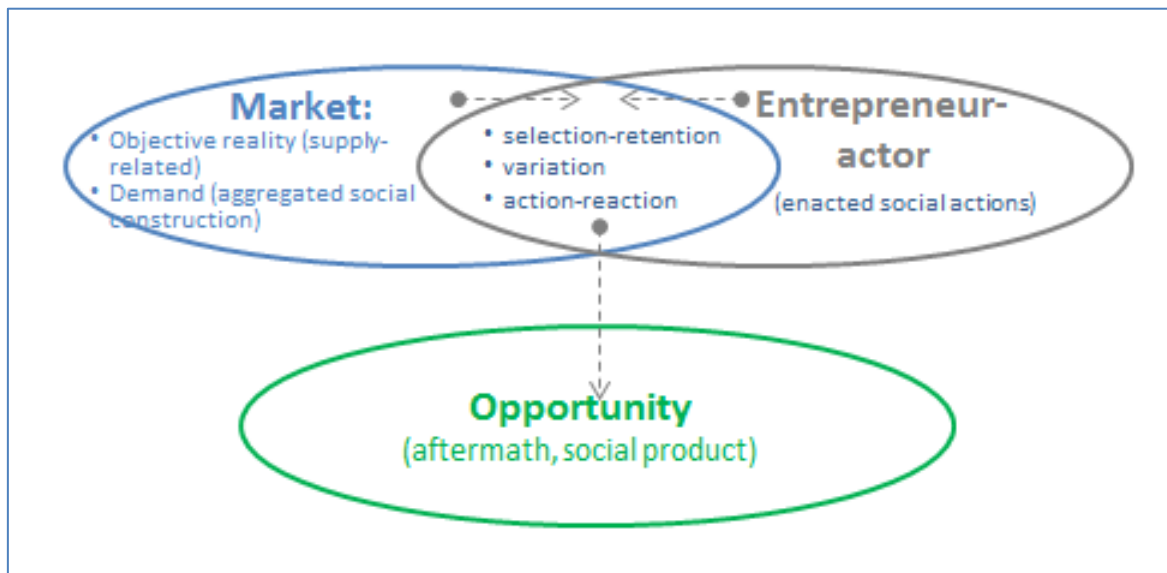
"In this sense" (Alvarez, et al., 2013, p. 308), the evolutionary-realists claim that creation opportunities do not exist until they are enacted or created by the entrepreneurs (Alvarez, et al., 2013, p. 308; Alvarez, et al., 2010, p. 30; Baker & Nelson, 2005; Gartner, 1985; Sarasvathy, 2001). The process entails an iterative process of action and reaction (Berger & Luckmann, 1966; Weick, 1979). Archichvilli, et al. (2003) refer to this as a process of "opportunity development" (p. 106). While the 'creation' claim may appear to be consistent with the

subjectivist paradigm on which the creation approach is based, there are a number of contradictions, if not flaws, in its conception.

First, to be ‘true’ to the subjectivist tradition, the creation approach has had to assume that “*neither* the supply *nor* demand exists prior to individual action: instead the entrepreneur participates in creating *both*” (Miller, 2007, pp. 61, italics added for emphasis). However, as evident from the review conducted above, the “objective external reality” (Alvarez, et al., 2010, p. 30) of opportunity in the social market structure relating to its supply and demand factors is necessary for the iterative process of action and reaction to happen. By logical implication, opportunity albeit “unobservable” must have a prior objective existence to provide the basis for validation that is integral to the constructionist process (Alvarez & Barney, 2010). By deduction, social construction of opportunity by the entrepreneur cannot continue without the *a priori* existence of the demand and supply factors. **Without the presence of these opportunity factors, no ‘opportunity’ will emerge.**

Second, if the claim by the evolutionary-realists is taken at face value, opportunity is created *ex nihilo* (Klein, 2008) to become the aftermath “outcome” (Wood & McKinley, 2010, p. 67) of the entrepreneur’s social construction work. Opportunity has no influence whatsoever on the entrepreneur’s action and the ‘entrepreneur-actor’ is the deciding factor. The **IO-nexus notion is irrelevant** in the creation approach, and the ‘nexus’ of entrepreneurial process is strictly between the entrepreneurs and the external social structure which is the market as environment as Figure 2.6 shows.

Figure 2.6 – Opportunity as enacted social product in creation approach



Third, by assuming that opportunities do not exist but created *ex nihilo* (Klein, 2008, p. 182), the creation conception is unable to explain the epistemological formation of opportunity where ‘part’ of it (*either supply or demand*) is observable and known to exist as in the constructionist conception. It also cannot explicate the discovery situation where opportunities exist *a priori* and are observable.

(D). Review summary

Following from the discussion above, the extant teleological approaches (discovery/positivist-realist, constructionist, and evolutionary-realist) that explain the existence, formation, and exploitation of opportunities (discovery, constructionist, and creation) adopt either an objectivist or subjectivist theoretical position on the ontological existence of opportunity. Each position entails “irreconcilably conflicting assumptions about the nature of the social world” (Moldoveanu & Baum, 2002). They are mutually exclusive philosophical views regarding the ontological existence of ‘reality.’ Hence by aligning itself with a particular theoretical position, the respective teleological approach’s conception of the ontological existence of opportunities, and explanation of the epistemological process of forming and exploiting opportunities (Alvarez

& Barney, 2007) will likewise reflect the adopted theoretical position's "contrasting ontological conception [of reality]" (Venkataraman, et al., 2012, p. 22).

(1). Philosophical handicap

As the literature review shows, the straightjacketing of the approaches to conform with a particular ontological view that does not necessarily reflect the natural or empirical social world often undermines the scope of, and creates paradoxes (Blumer, 1954) for, their respective teleological explanations on the epistemology of how opportunities are formed and exploited. The alignment obliges the teleological approach to make inconsistent and weak assumptions (McMullen, et al., 2007, p. 273), and to pre-suppose attributions of the other counterpart theoretical position when developing its epistemological commitments. This incidence of mutual attributions and meta-attributions, or attributions about attributions (Moldoveanu & Baum, 2002), is especially apparent in the teleological explanations offered by the constructionist and evolutionary-realist approaches. This creates generally inconsistent, incoherent, and fragmented perspectives on the epistemology of how opportunity is formed and exploited (Alvarez, et al., 2010, p. 28), and leads to confusion (Moldoveanu & Baum, 2002) over epistemological issues in the field of entrepreneurship.

For instance, a rigid interpretation of the objectivist position can relegate the IO-nexus in the discovery approach to a mere overlap between opportunity and entrepreneur as distinct and unrelated constructs (Sarason, et al., 2006). At the other extreme, the IO-nexus can lose its relevance altogether in the subjectivist context of the constructionist and creation approaches.

In the case of the subjectivist constructionist approach, opportunities are solely *the social products* of the entrepreneurs' enactments and social constructions. Paradoxically however, the constructionist approach needs to involve the objectivist attribution of external stimuli in the role of framing and prompting, (Gaglio, 2004, p. 544; Wood & McKinley, 2010, p. 67), as well as cross-validating the constructionist opportunities as they emerge from the entrepreneurs' social constructions. Despite its subjectivist tradition, the constructionist approach has to acknowledge the minimal logic that current market exists, albeit redefined by enactment and social construction through human action (Alvarez, et al., 2010).

Similarly, the evolutionary-realist approach with its fundamentally subjectivist view (that opportunity does not exist *a priori*) has to pre-suppose in its teleological explanations the objectivist attribution of an existing ‘market’ for the *post hoc* validation of opportunities as they emerge from the entrepreneurs’ social construction efforts. To keep its subjectivist veneer, the evolutionary-realist approach has had to ‘logicalize’ the market (and its demand and supply) as being a subjective social entity or structure, representing “the collective *social* constructions of *others*” (Alvarez, et al., 2013, pp. 307, emphasis added) that co-evolve as the entrepreneur co-enacts with other individuals to form the opportunity. It is within the social structure of the market (Aldrich & Kenworthy, 1999; Berger & Luckmann, 1966; Weick, 1979; Wood & McKinley, 2010, p. 68) that the iterative process of action, reaction, and interactions happens. Thus “opportunities cannot be understood *until* they exist” (Alvarez, et al., 2010, p. 30, emphasis added) and “they only exist *after* they are enacted” (Alvarez & Barney, 2010, p. 11; Baker & Nelson, 2005; Gartner, 1985; Sarasvathy, 2001; Weick, 1979). Hence, creation opportunity is non-existent in the evolutionary-realist approach and therefore has no influence whatsoever *until after* the entrepreneurial process is completed. While such views accord with the position of the *subjectivists*, the *objectivist* attribution of an *existent* market is paradoxically pre-supposed because creation opportunities cannot be exploited if they, or some form of objective realities, do not exist (Eckhardt & Shane, 2010, p. 48) *ex-ante* to act as the eventual benchmark for validation.

In general, the evolutionary-realists' line of reasoning poses a number of issues. *First*, as Alvarez, et al. (2010) admits, “[W]hen everything is *relative*, logical coherence is renounced” (pp. 28, italics added for emphasis). While the ‘market’ may be regarded as a socially constructed entity, it remains an exogenous phenomenon *relative to* the individual entrepreneur. By renouncing the status of market as an objective external reality and logicalizing it as a subjective social structure, the evolutionary-realist approach inadvertently limits the coverage of its teleological explanation to opportunities that they *then* assert as ‘non-existent.’ It therefore cannot be used to explain opportunities that appear to be non-existent when in fact they do exist but are latent and hence require human actions to manifest. *Second*, by renouncing the objective reality of market, the existence of the demand and supply elements of opportunity as objective realities is likewise renounced, even though their ‘existence’ is still required in the evolutionary-

realist approach to test and cross-validate the veracity of the entrepreneur's perception and social construction. *Third*, with the *a priori* existence of opportunity being renounced pursuant to the subjectivist position, entrepreneurial process is not a nexus of the entrepreneur as individual and opportunity. Entrepreneurial process happens only between the entrepreneur and the undefined social constructions of other individuals. The IO-nexus therefore has no place in the evolutionary-realist approach.

In summary, although research work on the three extant teleological approaches has contributed significantly to the understanding of how entrepreneurs engage with opportunities, the phenomenon of entrepreneurial opportunity *per se* “continues to remain poorly understood” (Dutta & Crossan, 2005, p. 426) and “elusive” (Dimov, 2011). The predicament has to do with the mutual exclusivity of the objectivist and subjectivist positions, which are clearly insufficient in and of themselves to explain the ontological existence of entrepreneurial opportunities as natural phenomena. Neither position can independently help the discovery/positivist-realist, constructionist, and evolutionary-realist approaches to articulate the nature of the social world, let alone the *ontological* existence of entrepreneurial opportunities. This handicaps the capacity of the respective teleological approaches to rationalize the *epistemology* of forming and exploiting opportunities, whether discovered, constructed, or created. Consequently, none of the opportunity-types *per se* can represent satisfactorily the IO-nexus as a holistic notion of “entrepreneurship as the dynamic interrelationship between the individual and the opportunity *over time*” (Sarason, et al., 2006, p.289, emphasis added). Such a limitation of extant ontological philosophies and teleological approaches to explain the phenomenon of entrepreneurial opportunities in turn hinders research progress in developing an understanding the IO-nexus idea, in particular the mechanisms by which opportunities influence the entrepreneurial *process* and are influenced by it.

(2). Philosophical options

To solve the dilemma, *one* option would be for researchers to keep *status quo* by adopting two different sets of philosophical positions. The problem with this option is that:

“[Researchers will then have to] work with unresolved tensions within a text where one follows different themes . . . without attempting synthesis – working with the tensions and contrasting images.” (Alvesson & Deetz, 2006, p. 273)

This will lead to “multiple interpretations of the same phenomena” (Alvarez & Barney, 2010, p. 558). As discussed in Section 2.6.3.2, by basing themselves on the mutually exclusive objectivist and subjectivist ontological assumptions regarding the existence and observability of opportunities, the three extant teleological approaches have caused paradoxical explanations even ‘within-approach.’

A *second* option that has “often been neglected but needs to be encouraged” (Fang, 2012a, p. 35) is to use “theoretical tensions or oppositions . . . to stimulate the development of more encompassing theories” (Poole & Van de Ven, 1989, p. 563), which is the preferred choice of this thesis. Specifically, this thesis will apply an alternate metaphilosophical position for “a single integrated theory” (Alvarez & Barney, 2010, p. 558) with the IO-nexus notion as the basis to embrace the different ‘types’ of opportunities, their ontological existences, and teleological approaches on the epistemologies of their formation and exploitation as explained by the contrasting positions. This will enable entrepreneurship study to be recognized in academic research as “a distinctive domain” (Shane, 2012, p. 10) involving the nexus of individuals and opportunities.

As shall be shown in Chapter 3, the alternative yin-yang philosophical position upon which this thesis premises its single integrated theory will need to reconcile the paradoxes identified in the three teleological approaches. At the minimum, the alternate philosophical view must contain *objectivist* attributions regarding the ontological existence of opportunity which, as the literature review above has shown, are commonly shared by the three teleological approaches – that is, that opportunities can and do exist *a priori* as external realities, albeit potentially unobservable (Alvarez, et al., 2010).

Alvarez, et al. (2013) concede, “[F]ew social constructionists argue that the world is ontologically unreal” (p. 307). It is only that market opportunities (like the reality of the world,

or its ‘being’) that exist are given ‘meaning’ and “become socially known” (p. 307) by the action and interactions of the entrepreneurs with others in the marketplace.

In reality, no single type of opportunity exists to the exclusion of others. A “single coherent position” (Alvesson & Deetz, 2006, p. 267) would better represent the dynamics of the social world where different opportunity-types can exist in different market-settings where startup-ventures operate. Toward this end, Chapter 3 of this thesis develops the conceptual O-O-P framework with the reflexive yin yang philosophical perspective that incorporates both the subjectivist and objectivist aspects, setting forth the distinctive nature of the entrepreneurship domain.

2.7 Venture-outcome vs. goals vs. performance-outcomes

This section examines extant views on the “outcomes” (Shane & Venkataraman, 2001, p. 13) to be achieved in the nexus of start-up entrepreneurial process between opportunity and the individual. A common criticism against the IO-nexus notion (Shane & Venkataraman, 2000; Venkataraman, 1997) is that it “focus[es] more on *process*” (Arend, 2014, p. 38) and does not explain the dimension of “outcomes” (Zahra & Dess, 2001, p. 8).

A number of scholars (e.g., Mueller, et al., 2012; Zahra and Dess, 2001) insist that the definition of entrepreneurship must include “the ‘outcomes’ of exploiting entrepreneurial opportunities . . . whether these outcomes are positive or negative, immediate or long term, or tangible or intangible” (Zahra & Dess, 2001, pp. 8, 9). However, this suggestion creates concerns in the research community as there can be many outcomes other than business performance (Shane, 2012, p. 11). Nonetheless, without understanding the meaning of ‘outcome,’ the IO-nexus notion will be found wanting as a parsimonious entrepreneurship theory that provides guidance and “logically consistent prescriptions for both policy and practice” (McMullen, et al., 2007, p. 273).

One reason for the inattention in literature is the fact that ‘outcome,’ more specifically the outcome for the startup-venture (**venture-outcome**) is often hard to define. While a number of approaches are used, none of them proves satisfactory. *One* approach often used is to equate

venture-outcome with *success*, commonly measured by financial gain for a venture in business. However, it is clear from the review made in Section 2.6.2.1 that favorability or profitability is not a natural connotation for the label of opportunity in entrepreneurship as Davidsson (2015) tries to allege. In extant definitions on entrepreneurship, profitability is a characteristic outcome for startup-ventures; although some researchers like Casson (1982) and Venkataraman (1997) limit their preference for exposition purposes to “only for-profit entrepreneurship” (Shane & Venkataraman, 2000, p. 219's footnote 3). As borne out by the high failure rates in the start-up industry, profitability is not necessarily a venture-outcome that start-ups can expect. ‘Bleeding edge’ ventures and loss-making internet start-ups are common in the history of technology entrepreneurship (Singh, 2001). The discovery approach would reason that it is because new start-up entrepreneurs cannot yet measure profitability at start up stage “because that industry has not reached equilibrium” (Shane & Venkataraman, 2001, p. 14). From the perspective of the creation approach, start-up entrepreneurs frequently operate ‘in the dark’ and are unable to see “the end from the beginning” (Alvarez, et al., 2010).

A *second* approach to measure venture-outcome is to use “a *predetermined* level of affordable loss or acceptable risk” (Sarasvathy, 2001, pp. 250, italics added for emphasis) for entrepreneurs to appraise the downside associated with their actions. From the perspective of Alvarez, et al. (2013), an affordable loss is the economic and personal value that prospective entrepreneurs are willing to forgo if their actions do not culminate in the formation of an opportunity. They believe that the concept of acceptable loss is better than opportunity costs because:

“... [w]hen creating an opportunity, entrepreneurs generally find it impossible to calculate the opportunity costs associated with their actions” (Alvarez, et al., 2013, p. 310).

Furthermore, they believe that the concept of acceptable loss helps entrepreneurs in deciding to abort their actions when actual losses incurred exceed what they deemed as acceptable.

While acceptable loss can conceptually be a surrogate measure for the venture-outcome of the entrepreneurial actions particularly at the start-up stage, there are still numerous challenges in ascertaining the outcome for new ventures. *First*, just as it is unreasonable to allege that

favorability is a connotation of opportunity, ‘loss-making’ is also not necessarily a general phenomenon that characterizes the opportunities of new startup-ventures. *Next*, if the entrepreneurs can solely predetermine their acceptable loss *ex-ante* to the commencement of the start-up processes, venture-outcome becomes a *subjective* concept over which ‘opportunity’ has no influence in the context of the IO-nexus. The question to ask then is how do start-up entrepreneurs predetermine *what* losses are *acceptable* when they are unable to calculate opportunity costs. In this regard, extant literature offers insufficient insights and explanations. Sarasvathy (2001) proposes to relate affordable loss or acceptable risk to the entrepreneur’s three Sarasvathian *means* of “they know who they are, what they know, and whom they know” (p. 250). Such benchmarks however are too general, if not ambiguous, and subjective to operationalize. In addition, if opportunity cost is impossible to calculate as Alvarez, et al. (2013) claim, so too will be acceptable loss as the two are opposite sides of the same coin that relates to resource constraints. Furthermore, the concept of acceptable loss contradicts Stevenson’s (2006) perspective that entrepreneurs pursue opportunity “without regard to resources currently controlled” (p. 3). Whether it is ‘favorability’ as Davidsson (2015) tries to argue, or ‘acceptable loss’ as Sarasvathy (2001) posits, these subjective measures are ‘personal’ to different entrepreneurs, and thus should be regarded more appropriately as ‘**entrepreneur-goals**’ that they can subjectively predetermine prior to starting the entrepreneurial process. As a minimum, *entrepreneur-goal* as a label acknowledges the individual entrepreneur’s “personal expectations, aspirations, and skills” (Ucbasaran, Westhead, & Wright, 2001, p. 15), which by nature are difficult to measure objectively.

A *third* proposal for the determination of venture-outcome is to use non-financial performance yardsticks and tie them to *events*, such as firm-level exit or survival events. The problem with this approach is in trying to define objectively *when* the outcome event happens, *what* the event constitutes, and therefore *how* to determine and measure the relevant event for a new start-up.

Thus, there are major difficulties with the various approaches for defining and predetermining venture-outcome prior to the start of a new venture. Even if a *post hoc* view is taken as some scholars would, there remain problems with isolating the objective causes of success (or failure) in the actual outcome that are attributable to the opportunity itself, from among the subjective

influences (such as the entrepreneur's preferences, choices, idiosyncrasies, skills, experiences, 'three Sarasvathian means' as mentioned above, and so on). Furthermore, the concept of *actual* outcome provides *no guidance* for decision-making and performance evaluation as it can only be determined *after* the entrepreneurial process is undertaken (Buchanan & Vanberg, 1991; Joas, 1996). Actual outcome is the "future [that] is contingent upon the non-deterministic individual actions and choices" (Alvarez, et al., 2010, p. 30). In addition, "external processes emanating from the greater social environment" (Short, et al., 2010, p. 57) also shape actual outcome. Since the actions of individuals entwine iteratively and inherently with social structures as Giddens' (1984) structuration theory posits, there are theoretical and practical difficulties in conceptualizing, let alone operationalizing, the *a posteriori* actual outcome as an *a priori* venture-outcome concept, which the IO-nexus notion would need to become a general theory on entrepreneurship.

In any case, actual outcome is merely a performance-related product (**performance-outcome**) that comingles (a) the non-deterministic actions and choices of entrepreneur, and (b) the influence emanating from the environment. It cannot serve the needs of *ex-ante* entrepreneurial planning *per se* or be an *a priori* guide for entrepreneurs. "[T]here is no 'end' until the creation process has unfolded, i.e., opportunities [and their outcomes] cannot be understood until they exist, and they only exist after they are enacted in an iterative process of action and reaction" (Alvarez, et al., 2010, p. 30; Aldrich & Kenworthy, 1999; Berger & Luckmann, 1966; Weick, 1979). Entrepreneurial process without knowing the *a priori* venture-outcome can be likened to "designing without final goals" (Simon, 1996, p. 162). There are no well-defined criteria against which to guide, judge, and evaluate the entrepreneurial process (Simon, 1996, p. 162). The theoretical basis of empirical results will be incomplete (Holcombe, 2003), making it difficult for practice and forward-looking research (Davidsson, 2015, p. 657) to formulate logically consistent prescriptions based on the IO-nexus notion.

In summary, extant approaches for *predetermining* the venture-outcome of a new start-up are either subjective or unsatisfactory. Even the *post hoc* concept of performance outcome (i.e., actual outcome) is difficult to determine and offers no theoretical or practical value. Moreover, all the approaches rely ultimately on the *entrepreneur* for the venture-outcome, either to be

predetermined by him/her, or as a product of his/her effort. The opportunity construct becomes passive and has no role to play whatsoever.

If a theoretical framework on entrepreneurial process is to be contextualized for the nexus between opportunity and the entrepreneur, then it must explain *how* opportunity that exists can objectively influence, if not determine, the venture-outcome or the *ends* of the entrepreneurial process on an *a priori* basis. In addition, the framework will need to address the circularity dilemma of “means influencing ends and/or ends influencing means” (Whittaker, et al., 2009). To do so, the framework must be *able to define the antecedent that determines the venture-outcome or ends on an ex-ante basis*, which then guides the entrepreneurial *means* or process taken to achieve it. Resolving the causal relationship as one of antecedents → ends → means (**A-E-M**) will then provide the theoretical basis (a) to formulate logically consistent prescriptions for both policy and practice, and (b) explain the empirical results for the entrepreneurship phenomenon.

2.8 ‘Opportunity’ or ‘idea’

Most recently, some scholars have tried to reconceptualize the IO-nexus notion. For instance, Davidsson (2015) offers new venture idea (“**NVI**”) as a substitute for the opportunity label in an attempt to displace the IO-nexus with individual-*idea* or actor**new venture idea* nexus (**A-NVI nexus**). The purpose is to expiate for the “lack of construct clarity” (p. 675)¹³ in the notion of opportunity. As shall be discussed below, Davidsson’s (2015) discourse does not solve the “inherent and inescapable problems with the ‘opportunity’ construct itself” (p. 674); it in fact creates more problems.

¹³ Davidsson (2015) base the conclusion from his finding that 80% of the 210 papers published since 2000 in leading journals do not offer a definition on opportunity (p. 679's Table 2:1).

2.8.1 Davidsson's reconceptualization

Davidsson (2015) explains that some scholars have deliberately avoided defining the concept of opportunity because of the complexity of its meaning. This has limited the progress of research on the IO-nexus notion. Of the “*minority of works*” (pp. 675, emphasis added) that do provide a definition of opportunity, he finds them convoluted and laden with “*vagueness and inconsistency* in the use of ‘entrepreneurial opportunity’ . . . [even] within works” (p. 677). He considers these definitions as symptomatic of the authors’ effort “to cover all bases” (pp. 677, emphasis added) with various assumptions. He asserts that “there can be no reason to keep the label ‘opportunity’” (p. 682), or “cling to the ‘entrepreneurial opportunity’ construct” (p. 690), because opportunity connotes *favorability*, and there are controversies over its objective vs. subjective ontological nature.

Regrettably, Davidsson's (2015) substitution proposal is untenable for two reasons. *First*, the favorability connotation of the opportunity ‘label’ is not corroborated by the definitions on opportunity in mainstream scholarly works. *Second*, the debate over opportunity's ontological existence as being objective or subjective is spawned by two mutually exclusive philosophical positions adopted by different scholars to conceptualize the three extant teleological approaches on the epistemological process of forming and exploiting opportunities. Displacing *opportunity* as a label or construct would not be justifiable without first exploring alternative philosophies that may embrace the conflicting scholarly perspectives on opportunity's ontological existence and epistemological formation process.

Moreover, Davidsson's (2015) A-NVI nexus proposal requires splitting the opportunity construct into three: External Enablers (**EE**), Opportunity Confidence (**OC**), and New Venture Ideas (**NVI**). The delineation runs counter to Barney's (2003) warning that ‘label proliferation’ impedes the development of management fields. The three suggested constructs complicate the study of entrepreneurship more than they clarify, and do not illuminate any more theoretical value than what opportunity can offer as an existing term. Above all, the three constructs compromise parsimony, and are respectively redundant, not operationalizable, and dysfunctional.

First, the ‘EE’ construct in the universe of Davidsson (2015, p. 684) refers to environmental forces that affect supply and demand. As we have seen from [Section 2.4](#)’s literature review, the IO-nexus already accounts for environmental forces manifesting as demand or supply changes, which are the systemic causes or antecedent root-origins of opportunity, a first-order component. The EE construct is thus redundant, as it brings no additional value for exposition purposes.

Next, Davidsson (2015) intends the OC to be a construct that helps define the degree of favorability and “eliminate perceived favorability from the [EE and NVI] constructs” (p. 675). This proposal is a continuance of the same concern he has with opportunity’s favorability connotation, even though it is *not* the perception in mainstream extant literature (see [Section 2.6.2.1](#)). The OC construct as Davidsson (2015) proposes is moot, as it is a subjective and perceptual variable determined solely by the *individual*, and an emergent product of *social interaction* (Davidsson, 2015, p. 685). In either case, the subjectivity of the actor-entrepreneur’s decision and the variability of his/her social interactions make OC a difficult construct to conceptualize, let alone operationalize, at both the practical and theoretical level. Yet Davidsson (2015) defers to other researchers to develop. For researchers to take up the challenge, they will need to operationalize the OC construct by explaining (a) how *confidence* can be objectively determined, and (b) what *level* of confidence is deemed appropriate for the entrepreneur to decide whether to continue with the entrepreneurial process. Davidsson (2015) himself concedes that OC is a difficult construct to operationalize. It is variable, and can wax and wane over time and space because OC is by nature momentary. Consequently, “OC is valid only for a particular point in time” (Davidsson, 2015, p. 685), and hence offers no guidance to the actor *prior to* starting the entrepreneurial process.

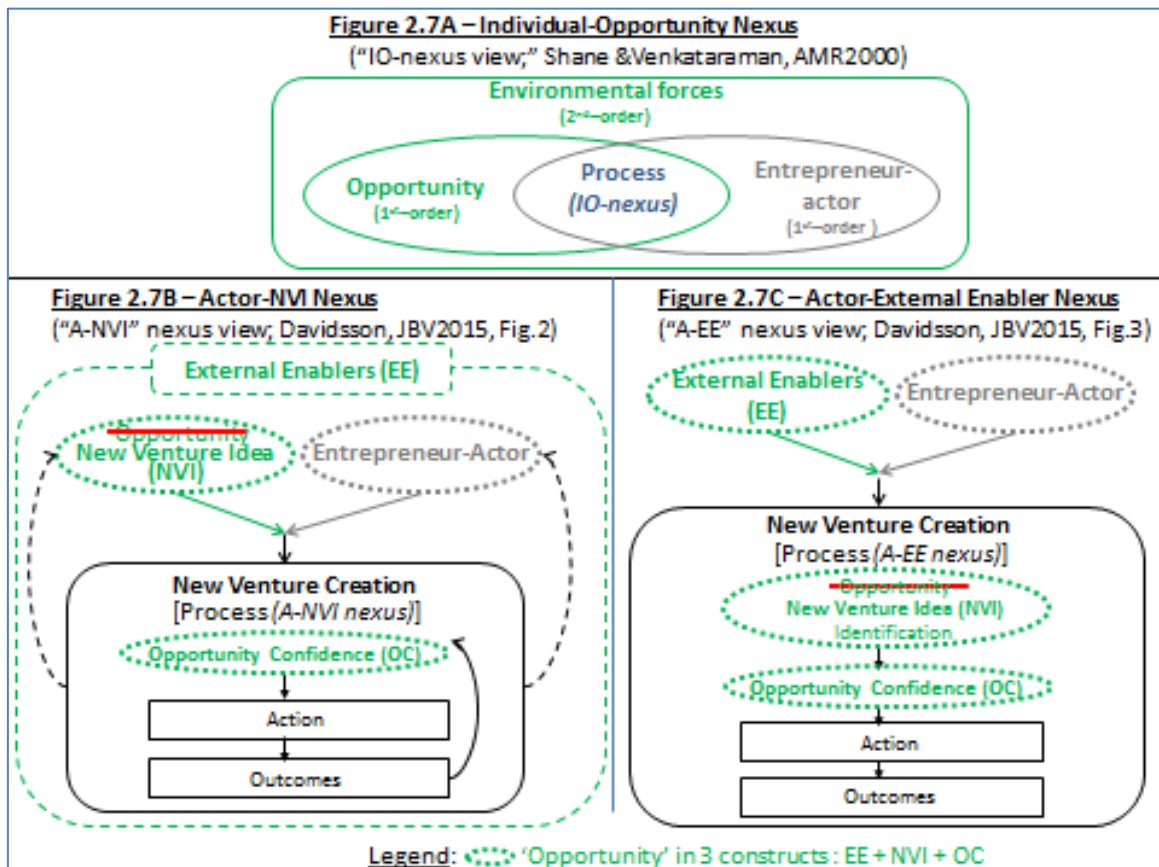
Third, the NVI construct is *dysfunctional*, contrary to Davidsson (2015) claim that:

“We have not found under any label a well-developed construct which corresponds to our notion of New Venture Idea, and which clearly distinguishes between the contents and the evaluation of what is being recognized.” (p. 685)

Far from being “well-developed,” the NVI construct is weakly held by assumptions with contradictory philosophical positions. For instance, Davidsson (2015) defines NVI as “imagined

future ventur[e]” (p. 685), which invokes *subjectivist* imagination of entrepreneurs. Yet he then renders it in his Figure 2 (p. 688), reproduced herein as Figure 2.7B, as having an *objective* existence in being the “main alternative to accompany the actor under the nexus view” (p. 675).

Figure 2.7 – IO-nexus vs. Davidsson's A-NVI and A-EE nexuses



As shown in Figure 2.7B, the ‘opportunity’ factor is ‘deleted.’ In its stead, NVI is positioned as an exogenous factor (rather than a subjective imagination) that exists to influence the entrepreneurial process in the *objectivist* tradition. This creates for Davidsson (2015) similar “within-work inconsistencies” (pp. 680, Table 3) that he faulted other scholars. His actor-NVI (A-NVI) nexus conception is also culpable of “ambiguity” (p. 677), as he confesses that it “does not address *where* the NVI’s come from in the first place” (p. 688). To address the dilemma, he then assigns EE as the possible ‘trigger’ of NVI, and introduces the Actor-EE (A-EE) nexus to supplement the A-NVI nexus as illustrated in Figure 2.7C, which is reproduced from Davidsson’s Figure 3 (p. 688). This flip-flops the substance of NVI into a constructionist or

creation opportunity of *subjectivist* tradition. Ultimately, the puzzle remains as to whether the NVI construct in Davidsson's (2015) universe has an *objective* existence or is the *subjective* outcome of the entrepreneur's social interaction. There is a within-author drift in the meaning of NVI due to the lack of a philosophical position. The NVI label therefore suffers as 'opportunity' does from the same "philosophical and logical opposition . . . [that can] dissuade [researchers] from applying it in empirical research" (2015, p. 684). In brief, Davidsson's (2015) attempt to remake the individual-opportunity nexus into an *individual-idea* notion is unsuccessful if not unnecessary. It lacks construct clarity (p. 675), and is no less elusive (p. 675), internally inconsistent (p. 676), convoluted (p. 677), vague (p. 677), variable (p. 677), and ambiguous (p. 677) than the opportunity concept that he charges other contemporary works to have committed.

2.8.2 How 'idea' relate to opportunity

Venture idea (Davidsson, 2004) or business idea (Shane, 2012)¹⁴ is *not* opportunity *per se*. According to Shane (2012, p. 15), venture or 'business ideas' and 'entrepreneurial opportunities' are different concepts. The latter exists exogenously as objective situation that is "*possible* to recombine resources" (Shane, 2012, pp. 15, emphasis added), where "*possible*" denotes what is "technologically feasible and market feasible" (Eckhardt & Shane, 2013, p. 162). In contrast, a business idea in practical terms is *subjective* and meaningful only to the entrepreneur behind it (Dimov, 2011, p. 65 + footnote 3). As Dimov (2011) observes:

"A particular entrepreneur can be linked to many different possible ideas but a particular idea can be linked only to the individual articulating it." (p. 70).

Business ideas are articulations of the entrepreneur's conjectures (Eckhardt & Shane, 2003; Shane, 2003), subjective beliefs, or "*interpretation* of how to recombine resources in a way that allows the pursuit [and exploitation] of opportunity" (Shane, 2012, pp. 15, italics in original text). They are "social constructions that do not exist independent of entrepreneur's perceptions"

¹⁴ Davidsson (2015) offers the term "venture idea" (Davidsson, 2004) and "new venture idea" or "NVI" (Davidsson, 2015), while Shane (2012) uses "business idea." No substantive differences actually exist among them. Since "venture idea" has not been noticed or consistently used by researchers, we shall use "business idea."

(Shane, 2012, p. 15). In other words, business ideas are perceived, or perceptual, *opportunities* (Dimov, 2010, p. 1126) conceptualized from the perspective of the individual entrepreneur at, or prior to, the ‘start’ of new venture creation.

Between an entrepreneur’s initial beliefs about his/her perceived opportunity, and the external stimuli (Grégoire, et al., 2010, p. 117) or objective reality (Alvarez, et al., 2013) of the entrepreneurial opportunity that is possible, there is frequently a mismatch (Alvarez, et al., 2013). One of the reasons is because entrepreneurial opportunities may be “potentially unobservable” (Alvarez & Barney, 2010, p. 565) to the entrepreneur. Thus a business idea that represents the perceived opportunity can be regarded as a plan formed by the entrepreneur in response to his/her subjective beliefs about the entrepreneurial opportunity (Shane, 2012). Where the opportunity is observable as in the discovery approach, the business idea is a straightforward, causative blueprint for pursuit and exploitation. Conversely, where the entrepreneurial opportunity is “initially invisible” (Dimov, 2011, p. 68) or unobservable, whether partially or fully, as in the constructionist approach and creation approach respectively, the entrepreneur can only construct or create the business idea *ex nihilo* on the basis of his/her subjective perception of the existence of the entrepreneurial opportunity (Shane, 2012). The prescience and value of opportunity in its perceptual state cannot be confirmed *ex-ante* (Dimov, 2010), so that the business idea may (or may not) be considered viable as it gets developed (Davidsson, 2003; Dimov, 2007b). Nonetheless, starting in an initial “rudimentary and malleable form” (Davidsson, 2015, p. 685; Sarasvathy, 2001), the veracity of the “imagined future state” (Davidsson, 2015, p. 677) of the business idea can only be validated and manifested gradually and contextually as actions are undertaken by the start-up entrepreneur (Davidsson, 2003; Dimov, 2007b; Sarasvathy, 2001). As Dimov (2011, p. 69) describes:

“[A business idea is] an evolving blueprint for action that interweaves the entrepreneur’s resources, aspirations, and business templates.” (pp. 69, emphasis added).

From the entrepreneur’s perspective, a *business idea* is the focal object of the EDE processes nested in the IO-nexus (Davidsson, 2004, p. 27) and enacted by the entrepreneur in the social context of the market (Alvarez & Barney, 2010, p. 565; Weick, 1979). As it is changed and honed over the course of social construction by the entrepreneur, the business idea becomes

more elaborate and “qualify as what others would call a business concept or a fully developed (conception of a) business model” (Davidsson, 2004, p. 27). The entrepreneur refines the business model based on feedbacks received from his/her interactions with the market. He/she will continue to do so until his/her action reveals that the “subjective belief in an opportunity [is] ‘correct’” (McMullen, et al., 2007, p. 277), or possible, in the sense of being a *goal* that is “technologically feasible and market feasible” (Eckhardt & Shane, 2013, p. 162). Only *then* is the perceived opportunity “viewed as objective” (McMullen, et al., 2007, p. 277). The evolution of business idea to business concepts that culminates in the formation of a business is what Ardichvili et al. (2003) call “opportunity development” (pp. 106, 113).

Following from the above discussion, it is the *subsequent* events (McMullen, et al., 2007, p. 277) and enacted EDE actions of the entrepreneur that validate, reveal, and judge a *subjective* business idea (hitherto meaningful only to the entrepreneur) to be an entrepreneurial opportunity that exists¹⁵ as an objective external reality (Alvarez & Barney, 2010, p. 565). Hence, an entrepreneurial opportunity objectively exists, and manifested and considered as “correct” (McMullen, et al., p. 277) in the *aftermath* of human action enacted on the subjective belief expressed initially as a business idea. On the other hand, the entrepreneurial opportunity is *then* deemed not to exist if entrepreneurial actions reveal that the business idea is incorrect or not technically and commercially feasible (Dimov, 2010, p. 1126). Rather than or risking failure, the start-up entrepreneur may “give up” (Alvarez, et al., 2013, p. 308) on his/her subjective belief, abandon venturing efforts, and discontinue the venture (Dimov, 2010).

2.9 Chapter summary

This chapter reviews several research themes in extant literature as a precursor to developing the thesis’ conceptual O-O-P framework that explains and operationalizes the start-up entrepreneurial process as a nexus between opportunity and the entrepreneur (Venkataraman,

¹⁵ Insofar as the creation approach is concerned, entrepreneurial opportunities would be considered as having been ‘created’ out of business ideas.

1997). The themes covered in the review include entrepreneur as individual, entrepreneurial process, and entrepreneurial opportunity's characteristics and nature (like its antecedents, ontological existence, and epistemology of its formation and exploitation).

What is apparent from the literature review is that entrepreneurship research lacks a general conceptual framework (Shane & Venkataraman, 2000), resulting in a diversity of definitions, fragmentation in the treatment of themes, and a lack of parsimony. To resolve, the IO-nexus is introduced as a parsimonious explanation for the start-up entrepreneurial process as involving the entrepreneur and opportunity (Venkataraman, 1997). However, the review in this chapter of the thematic discussions of entrepreneur, opportunity, outcome, environment, and process constructs in extant literature reveals scholarly tensions that are posing impediments to the progress on the IO-nexus idea. The inadequacy of the *entrepreneur* construct for instance in explaining the entrepreneurial process has encouraged research studies to shift towards the *opportunity* construct which holds promise as *the* “initial condition” that the entrepreneurial process may be “sensitive to” (Bygrave, 1993, p. 255; Hofer & Bygrave, 1992, p. 92). Yet extant research work on the opportunity aspect has remained quite fragmented.

At the conceptual level, the debate among scholars on what exactly constitutes an opportunity has generated a considerable amount of *definitions* and *perspectives*. There is no evidence from the review of these extant definitions that opportunity connotes favorability, albeit there is general agreement that the label involves innovation, risk, and uncertainty in varying degrees. These definitions are often times ambiguous and inconsistent (McMullen, et al., 2007). In addition, their perspectives reflect “intractable differences” (McMullen, et al., 2007, p. 279) consequent upon mutually exclusive *theoretical* positions taken on the ontological *existence* of opportunity that do not elucidate its antecedents. Even worse, their received theoretical views create paradoxical tensions and contradictions *within* the teleological approaches that are semantically confusing and divisive when explaining the *epistemological process* of forming and exploiting opportunities.

A review of Davidsson's (2015) attempt to circumvent theoretical tensions by offering the ‘idea’ label as a substitute for ‘opportunity’ demonstrates that it adds more complication than it tries to solve. The ‘idea’ label is confounded by the same ontological and epistemological issues that

entrepreneurship research will still have to explain. Adopting *idea* in place of *opportunity* is akin to throwing the baby out of the bathwater by taking researchers off the beaten track of entrepreneurship studies that are based on the IO-nexus notion.

With regard the alleged absence of the *outcomes* and *environmental dimensions* that cause the IO-nexus notion to lose its operability for entrepreneurship research and practice, the literature review conducted herein suggests otherwise – both dimensions are already ingrained in the IO-nexus notion, except that researchers have tended to overlook.

To solve the current predicaments in literature, the next chapter proposes the conceptual O-O-P framework to contextualize and operationalize the IO-nexus notion. It takes an alternative metaphilosophical view as the middle ground to integrate the disparate extant teleological explanations on the important aspects of the nature of different entrepreneurial opportunities in the nexus of interaction with the entrepreneur in the start-up entrepreneurial process. Hence, Chapter 3 will develop the theoretical basis to define for the IO-nexus idea the antecedents of entrepreneurial opportunities, and in turn how they determine the venture-outcomes, orientations, and ends-means relationships of the start-up entrepreneurial process. The inclusion of these attributes operationalizes the IO-nexus notion and enhances its theoretical propensity in providing logical and consistent prescriptions for policy and practice, and validating empirical results and variances.

Chapter 3 – OPPORTUNITY-OUTCOME-PROCESS (O-O-P) CONCEPTUAL FRAMEWORK

Davidsson's (2015) calls on researchers to “unleash previously under-utilized potential” of entrepreneurship research and further its progress. This thesis does so by revealing the intrinsic qualities, hitherto neglected, in the IO-nexus first posited by Venkataraman (1997) and later developed by Shane and Venkataraman (2000; 2001), and systematically operationalizing them within its conceptual O-O-P framework to set forth *a single integrated parsimonious theory* for the study of start-up entrepreneurial phenomenon as a “distinctive domain” (Shane, 2012, p. 10). The yin-yang duality concept (one of the philosophies in China) is applied as the metaphilosophical paradigm (see Paragraph (D)(2) of Section 2.6.3.2), allowing the conceptual O-O-P framework to:

- (a) manifest the defining characteristics of entrepreneurial opportunity as deduced from the literature review in Chapter 2;
- (b) reconcile, “rather than suppress” (Lewis, 2000, p. 764), the paradoxical tensions and contradictions as identified in the three extant teleological approaches, namely
 - (i) opportunity exists but may be unobservable, unknowable, and undetectable (“**Paradox #1**”), and
 - (ii) the opportunity and entrepreneur constituents in the IO-nexus are independent but interdependent (“**Paradox #2**”);
- (c) embrace and consistently apply the extant teleological approaches to explain the epistemological formation and exploitation of different types of opportunities; and
- (d) apply the formal logic derived from the antecedents (demand and supply) of opportunity to determine on an *a priori* basis the venture-outcomes (the ends) and the orientation of the start-up entrepreneurial process needed to bring the means to meet the ends.

The first section of this chapter highlights the challenges in developing a single integrated parsimonious entrepreneurship theory to be fulfilled through the conceptual O-O-P framework. The next section gives the reason for the yin-yang duality concept to be the alternative philosophical paradigm that unifies extant theoretical positions. An overview on the yin-yang notion is provided in the following section. The fourth section rationalizes the opportunity construct and the IO-nexus based on the yin-yang perspective and, in the process, resolves the paradoxes uncovered from the review of extant literature. The fifth section develops the conceptual O-O-P framework for the IO-nexus notion to serve as a single integrated theory on entrepreneurship that explains the startup-venturing process and its variables, such as the antecedents of opportunities, *a priori* venture-outcomes, orientations, and causal ends-means relationships among the variables. The last section closes with a summary.

3.1 The challenges of a single integrated theory

The review of extant literature in the previous chapter reveals its fragmented status, which poses hurdles to the development of a single integrated framework to “explain and predict” (Shane & Venkataraman, 2000, p. 217) the entrepreneurship phenomenon. As reported in Chapter 2, the *entrepreneur* construct alone cannot explain entrepreneurial action and outcomes. While researchers have paid “considerable attention to ‘entrepreneurial opportunities’” (Davidsson, 2015, p. 674) in the IO-nexus idea, they have managed to describe only certain aspects of opportunity and the process of its relationship with the entrepreneur. Their explanations are insufficient for a unified entrepreneurship theory to be articulated (Wood & McKinley, 2010).

As Hansen, Shrader, and Monllor (2011, p. 285) succinctly observe:

“[There is a] wide variety of definitions, sometimes ambiguous, sometimes contradictory, resulting in a considerable amount of variance in perspectives.” (p. 285)

Thus opportunity is currently seen as *either* (a) a phenomenon that objectively exists and is distinct from the entrepreneur (Shane, 2003) as represented by the *objectivists*, *or* (b) a phenomenon intricately linked to and arising from the individual’s own subjective perception,

cognition, and actions (Sarason, et al., 2006) as the *subjectivists* argue. The philosophical thinking that polarizes the objectivists and subjectivists over entrepreneurial opportunity as *either* reality *or* perception is a classic example of Western formal dialectic logic, which considers objective reality as two elements of material substance and the mind's activity (which includes thinking, reflecting, and perception) that contradict each other "as exclusive opposites" (Fang, 2012a, pp. 26 citing Chen, 2002). This "either/or" perspective (Fang, 2012a, p. 31; Lewis, 2000, p. 761; Li, 2008, p. 416) reflects "*dualism* (opposites in conflict) embraced in the West" (Li, 2008, pp. 416, emphasis added), the more modern versions of which have their origin in René Descartes' *Meditations* (Robinson, 2016; Stokes, 2010).

In entrepreneurship literature, such mutually exclusive philosophical views have caused confusion in the understanding of the nature of entrepreneurial opportunities, as well as "unanticipated themes . . . [t]he most central is paradox" (Eisenhardt K. , 2000, p. 703) in the extant teleological explanations on the epistemological process of opportunity formation and exploitation. Eisenhardt (2000) describes 'paradox' as:

" . . . the simultaneous existence of two inconsistent states, such as between innovation and efficiency, collaboration and competition, or new and old. " (p. 703)

Hitherto, dualism of "coexisting tensions" (Eisenhardt, 2000, p. 703) such as those modelled after Descartes have limited the progress of research on the mechanisms by which opportunities influence the entrepreneurial process in the IO-nexus (Davidsson, 2015). In this connection, the paradoxical tensions and contradictions identified by the literature review of Chapter 2 in the constructionist and evolutionary-realist approaches relates to the situation where their *subjectivist* legacy is unable to rationalize and reconcile the paradoxical tension of entrepreneurial opportunities being objectively existing *but* non-observable (tied to Paradox #1). Since Western dialectical thinking "regards paradox as a *problem to be solved*" (Li, 2008, pp. 416, emphasis added), the two teleological approaches have had to straightjacket entrepreneurial opportunities as non-existent to conform with their subjectivist ontological position even though it may not reflect the natural or empirical social world (Blumer, 1954). In the process however, they create a tension and contradiction because the existence of opportunity has to be pre-supposed in their explanations to provide the validation basis for the selection and retention actions of the

entrepreneur as he/she forms and exploits opportunity. As Li (2008) observes, “Western dialectical logic fails to truly transcend the either/or logic” (p. 416). Formal, rational logic cannot deal with paradox (Eisenhardt, 2000)

The other tension and contradiction identified in Chapter 2 is in the objectivist view of the discovery approach, which posits the interdependence, and complementarity of entrepreneurial opportunity and the enterprising individual (tied to Paradox #2). Yet by accepting the objectivist perspective of entrepreneurial opportunities as realities that exist *even if* unobservable, unknowable, or detectable, the discovery approach inadvertently creates a *tension* for itself. The entrepreneurial opportunity is then treated as a construct “separate and distinct from” (Sarason, et al., 2006, p. 288) the enterprising individual in the entrepreneurial process, thereby *contradicting* the spirit and intent of Shane and Venkataraman’s (2000) IO-nexus notion. This is discussed in Paragraph (A) of Section 2.6.3.2 and visualized in Figure 2.4.

While the tensions, oppositions, and contradictions causing the various conceptual difficulties as reported above do pose significant challenges, Poole & Van de Ven (1989) reckon that they are a hotbed of insights for stimulating the development of “more encompassing theories” (p. 563) such as the conceptual O-O-P framework of this thesis. To embrace paradoxical tensions in social theory, the authors encourage researchers to apply theory-building strategies that:

- (a) accept and use the theoretical tensions constructively (“**P&V strategy #1**”);
- (b) clarify the levels of analysis (“**P&V strategy #2**”)¹⁶;
- (c) separate temporally the two levels (“**P&V strategy #3**”); and
- (d) introduce new terms to resolve the paradox (“**P&V strategy #4**”).

As Lewis (2000) counsels, the purpose of managing paradoxical tensions is *not* a compromise between competing tensions, such as objectivity versus subjectivity, flexibility versus control

¹⁶ In the context of this thesis, the analysis of tensions is at the startup-venture “micro level” (Poole & Van de Ven, 1989, pp. 570, Figure 1) where the entrepreneurial process happens.

(tied to P&V strategies #1, #2, and #3), existence versus nonobservability, or separate/distinct versus interdependent. Rather, it is to create an awareness of their coexistence (tied to P&V strategies #1, #2, and #3).

Eisenhardt (2000) echoes the same advice in her introduction to the special topic forum on the theme *Paradox, spirals and ambivalence: The new language of change and pluralism* hosted by the Academy of Management Review in 2000¹⁷. She exhorts the potential merits of a ‘both/and’ perspective over the favored ‘either/or’ view, advising, “Formal, rational logic cannot deal with paradox” (p. 704). She suggests theories be built to explore the duality of coexisting tensions “in a creative way that *captures both extremes*, thereby capitalizing on the inherent pluralism within the duality” (pp. 703, emphasis added) (tied to P&V strategies #4, #3, #2, and #1).

3.2 The yin-yang duality concept as the alternative philosophical position

This thesis heeds the scholarly advice in developing its conceptual O-O-P framework at the “micro level” (Poole & Van de Ven, 1989, p. 570's Figure 1) of the startup-venture, where the entrepreneurial process happens (tied to P&V strategy #2). Specifically, the Chinese yin-yang duality concept is introduced as the philosophical paradigm, an alternative metatheoretical intervention (Ramoglou & Tsang, 2016, p. 411), and a *middle ground* perspective (tied to P&V strategy #4). The reason is that it articulates the nature of the social world and best reconciles the coexistence of contradictions (tied to P&V strategies #1 and #3) inherent in Western thinking on the ontological nature of entrepreneurial opportunity. Hitherto, the dialectical logic of the objectivist and subjectivist positions have caused “limitations or flaws” (Poole & Van de Ven, 1989, p. 567) in extant research. Being “exclusive opposites” (Fang, 2012a, pp. 26 citing Chen, 2002), the two theoretical positions are unable to constructively rationalize the “theoretical tensions or oppositions” (Poole & Van de Ven, 1989, p. 562) residing in the ontological nature of opportunity, except with paradoxical explanations (tied to P&V strategy #1).

¹⁷ Coincidentally, it happened in the same year as the article on *The promise of entrepreneurship as a field of research* (Shane & Venkataraman, 2000) was published.

As Poole and Van de Ven (1989, p. 575) surmise, a new framework can be defined if the theoretical tensions can be characterized, which this thesis has managed to gather from its literature review. By applying the Chinese yin-yang perspective to constructively resolve the research paradoxes identified in contemporary social studies¹⁸, this thesis is yet another illustration among several others presented by Barkema, et al. (2015) where scholars can transcend the “blind emulation of natural sciences” (Li, 2011, p. 6), with potential for enriching and advancing management knowledge, concepts, theories, and paradigms. In particular, the Chinese yin-yang philosophical paradigm makes it possible for the conceptual O-O-P framework to explain the link between opposing forces (a) of demand and supply antecedents within the dualistic *opportunity-nexus*, and (b) opportunity and enterprising individual within the dualistic IO-nexus of entrepreneurial process. It also enables the conceptual O-O-P framework to give *meaning* to the apparent contradictions (Vince & Broussine, 1996), such as the perspectives of the objectivists and subjectivists, the existence and unobservability of opportunity, and the several and interdependent relationship between opportunity and entrepreneur in the IO-nexus.

3.3 Overview of yin-yang duality concept

The symbiotic yin-yang perspective developed by Fuxi (2,800 BCE) is an appropriate philosophical foundation for this thesis to conceptualize entrepreneurial opportunity and rectify the dual paradoxes identified in extant teleological explanations on the start-up entrepreneurial process. The yin-yang perspective itself is a *duality* concept and indigenous to many traditional Chinese philosophies, language, science, medicine, martial arts, literature, politics, behavior, and beliefs (Fang, 2012b; Fang & Faure, 2011; Wang & Chen, 2013). The Chinese yin-yang concept describes how seemingly dialectical opposing natural and social elements in different states and *manifestations* are in fact *dualities* that interact and complement each other “as interdependent

¹⁸ Barkema, et al. (2015) in the special research forum hosted by The Academy of Management Journal examined publications in six research areas. They include cross-cultural communication, paradoxical leadership behavior, person-organization fit, political representation, information transfer channels, and tensions of Fairtrade. Other authors have researched topics like competition-cooperation (Chen, 2008), culture (Fang, 2012a), leadership (Gou & Dong, 2011), organizational performance (Law & Kesti, 2014), the concept of trust (Li, 2007, 2008, 2011), and globalization and anti-globalization (Wang & Chen, 2013).

opposites” (Fang, 2012a, pp. 26 citing Chen, 2002) to form a dynamic paradoxical but indivisible unity or ‘whole.’ Hence, being a ‘both/and’ concept that embraces complementation and conflict (Fang, 2012a), the yin-yang *duality* differs from the ‘either/or’ *dualism* notion of Descartes (Stokes, 2010).

3.3.1 Examples of yin-yang co-dependent elements

Examples of co-existing and co-dependent dualistic yin-yang elements in their respective states and manifestations interacting in the natural universe are listed in Table 3.1 below.

Table 3.1 – Examples of *yin* and yang dualistic elements ((Fang, 2012a, p. 31)

Yin (black ‘tadpole’ portion)	Yang (white ‘tadpole’ portion)
Supply (or demand) – emerging/new	Demand (or supply) – existing/old
Supply (or demand) – non-observable, non-knowable, non-detectable	Demand (or supply) – observable, knowable, detectable
Female / Femininity	Male / Masculinity
Subjective	Objective
Moon	Sun
Night	Day
Water	Fire
Death	Life
Poverty	Wealth
Grassroots	Elites
New	Old
Darkness	Light/brightness
Low	High
Softness	Hardness
Weakness	Strength
Few	Many
Out	In
Cold	Hot
Shady	Sunny
Shadowy	Clear/distinct
Latent/covert	Overt
Obscure	Plain
Unobservable	Observable
Passivity/Stillness/Rest	Activity/Motion
Negative	Positive

In the Chinese language, for instance, numerous terms are juxtapositions of two characters that embrace contradicting ideas. Thus, ‘high’ (高) and ‘low’ (低) together signify ‘comparison’ (高低). ‘East’ (東) and ‘west’ (西) indicate ‘things’ (東西), ‘many’ (多) and ‘few’ (少) form ‘how much’ (多少), ‘spear’ (矛) and ‘shield’ (盾) combined to mean ‘contradiction’ or ‘paradox’ (矛盾), ‘inside’ and ‘outside’ denote ‘everywhere’ (內外), ‘ancient’ and ‘modern’ constitute ‘history’ (古今), ‘life’ and ‘death’ suggest ‘turning point’ (生死), and ‘loosen’ (鬆) and ‘tighten’ (綁) merging to symbolize ‘flexibility’ (鬆綁).

A classic example of dualistic yin-yang logic known in the business community is ‘crisis,’ or ‘wei-ji’ (危機), a word expressing the Chinese concept that the two paradoxical concepts of ‘adversity’ (危) and ‘opportunity’ (機) are dynamically interlinked. On the one hand, opportunity can present danger and the potential for crisis. On the other hand, crisis is not seen as an unassailable problem but as a paradoxical turning point for opportune action (轉機) to transform adversity. Thus, during the Asian financial crisis (AFC) of the late 1990s, economic analysts exhorted *wei-ji* as the strategic perspective to tap adversity for opportunities. Sovereign funds like Singapore GIC used the crisis to buy the Bank of America Merrill Lynch Financial Centre in London for £480, and sold it for £582.5 million in 2014, generating £102.5 million in the process. For those private investors who invested in distressed financial instruments, they profited from the volatile and risky conditions when the value of their portfolio appreciated after the AFC.

Similar dualistic but seemingly paradoxical phenomena are also commonly described in Western writings. Thus in his book, *And the weak Suffer What They Must*, Varoufakis (2016) says:

“Indeed, this book is about a paradox: European peoples which had hitherto been uniting so splendidly have ended up increasingly divided by a common currency. The paradox of a divisive common currency . . . the narrative of grasshoppers and ants, of bailouts and austerity . . .” (p. 6)

According to Sarason, et al. (2006), the concept of duality is gathering momentum in Western sociology and organization theories (p. 290), such as the works of Dillard, et al. (2004) and Reed (1997). Indeed, the ‘spirit’ of the Chinese yin-yang duality logic is not uncommon in Western

writings, albeit it may be partially represented or interpreted. It is compatible with certain Western views (Ilinitich, D'Aveni, & Lewin, 1996; Osborn & Hagedoorn, 1997). In a sense, the ontologically *subjectivist* and *objectivist* 'lens' are the dualistic constituents of the yin-yang notion but in their respective fragmented *yang* and *yin* states/manifestations, including observability, 'knowability' (Venkataraman & Sarasvathy, 2001), and detectability. **When enjoined and entwined as a yin-yang duality however, they present a holistic view of natural phenomena in the world as encompassing dynamic and dialectical *dualities***, offering the philosophical basis with the best potential to build integrative frameworks regarding complex phenomena (Lado, Boyd, Wright, & Kroll, 2006; Lewis, 2000; Li, 1998; Li, 2007; Li, 2008; Poole & Van de Ven, 1989). Such integrative frameworks include *inter alia* the conceptual O-O-P framework, which complements the IO-nexus notion, itself a duality, in describing and explaining:

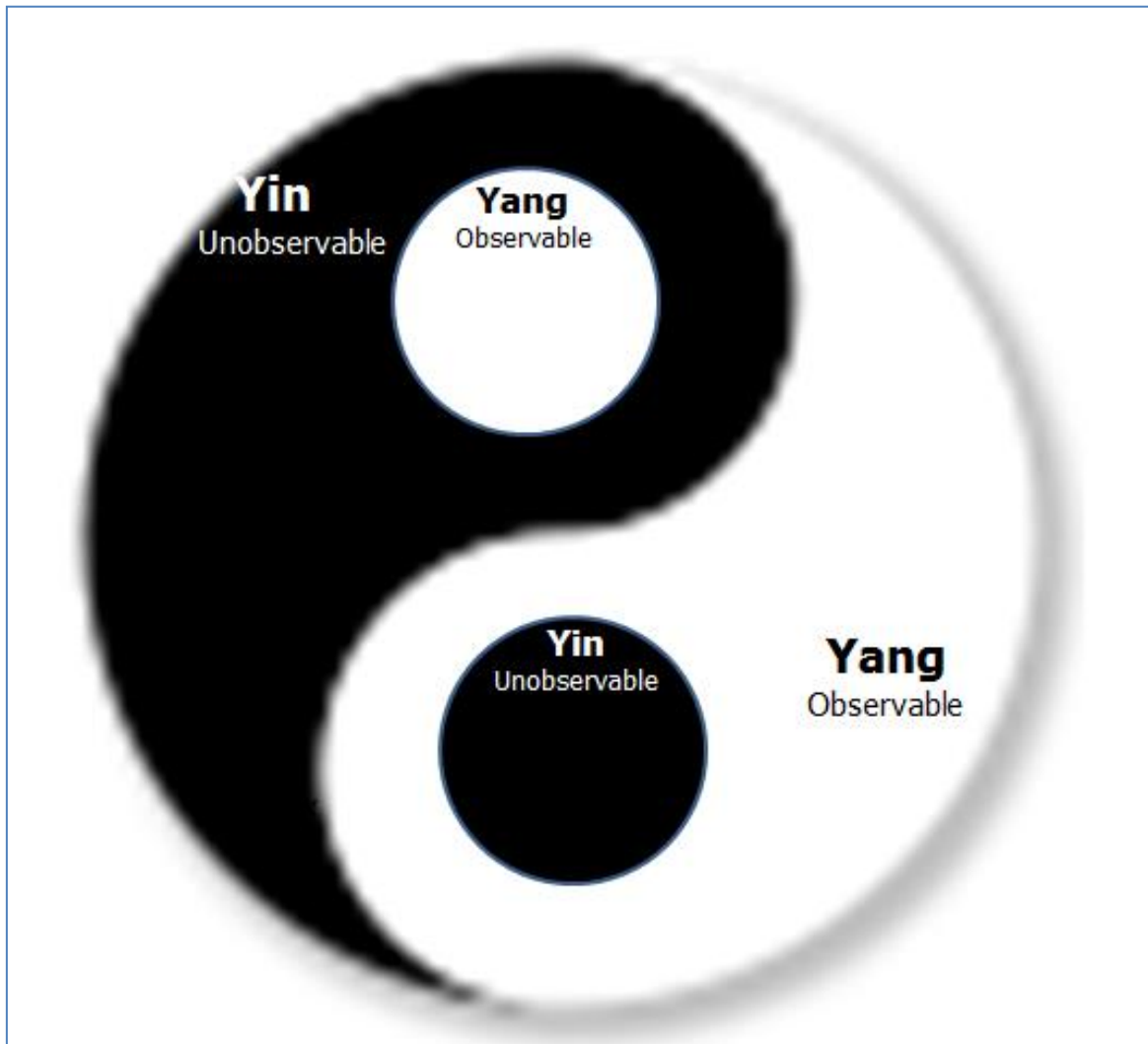
- (a) the ontological nature of opportunity as a nexus involving the dualistic forces of demand and supply, and
- (b) the start-up entrepreneurial process as a nexus involving the dualistic constructs of opportunity and the individual.

3.3.2 Graphical visualization of yin-yang concept

Traditionally, the yin-yang concept is represented and visualized by the "Taijitu" symbol (Wang, 2005) shown in Figure 3.1. The Taijitu signifies a natural integrated wholeness composed of contradictions (Chen, 2002; Lewis, 2000)¹⁹. The Taijitu is not unfamiliar to western cultures and is arguably the best-known symbol in East Asia (Cooper, 1990). It helps to **visualize** the underlying dualistic *yin-yang* epistemological concept which is widely used to explain natural and social dualities in the universe that are rationalized as co-existing and co-dependent elements interacting complementarily with each other (Wang & Chen, 2013).

¹⁹ See also Hampden-Turner (1981, pp. 20-21), Morgan (1997, pp. 283-285), and Rothenberg (1979, pp. 140-142) for discussions of this symbol.

Figure 3.1 – Yin-yang elements rendered in Taijitu



The Taijitu's outer circle represents an integrated whole (tied to the holistic duality tenet), but is divided into the co-existing states and manifestations (including observability, knowability, and detectability), comprising *yin* represented by the *black* 'tadpole' rising on the left, and *yang* depicted by the *white* tadpole descending on the right (tied to the dialectical duality tenet explained in [Section 3.4.3](#)). The ascendancy and descendancy reflect constant evolution and transformation of one state/manifestation into the other (tied to the dynamic duality tenet explained in [Section 3.4.2](#)). It also suggest *co-dependency*, in that neither *yin* nor *yang* alone can nurture itself, but "the two together [as a duality] do so and develop [each other] through mutual generation and promotion" (Wang & Chen, 2013, p. 2). The white and black dots at the 'head' of

the black and white tadpoles respectively emphasize that opposite state of manifestation do *co-exist* even within a given state, and how one state begins to evolve and transform itself into the opposite state as it approaches its full potential.

In effect, the characteristics of the natural world as articulated by the yin-yang duality notion with its Taijitu are bestrewn in the *realist* view offered by Ramoglou and Tsang (2016) as the following quotations indicate (with yin-yang characteristics juxtaposed in square parentheses):

“The world exists objectively, albeit in various modes of being [yin-yang dualities]. The real [outer circle of Taijitu] is broader than the domain of the empirically observable [yang]. Tendencies are unobservable [yang] and operate transfactually.” (p. 413)

“. . . the most fundamental and interesting property of our world lies in its unrealized [yin] propensities (Bhaskar, 1978) . . . propensities are physical realities [yang] and ‘not mere possibilities. They are as real as forces’ (Popper, 1990, p. 9) . . . propensities may remain unactualized [yin] because powers may not be triggered and, when triggered, need not be evident [yin], either because countervailing [dualistic] factors may constrain their empirical realization or because additional enabling factors might be absent. In such occasions unobservable [yin] tendencies are said to operate transfactually. For example, gravity operates constantly, although its effects are not always evident [yin]: the active tendency [yin] of a cup on a desk to fall is countered [yang] by the desk (Lawson, 2009; Tsang & Kwan, 1999).” (p. 412)

3.4 Relating yin-yang perspectives to entrepreneurial opportunity and the IO-nexus

As shall be discussed below, the yin-yang duality principle with its three primary tenets that describe the ontological nature of entrepreneurial opportunities and the entrepreneurial process of the IO-nexus is able to encompass holistically all the four P&V strategies. It (a) accepts objectivism and subjectivism as mutually exclusive paradoxical themes (P&V strategy #1), (b) acknowledges their spatial (P&V strategy #2) and temporal (P&V strategy #3) separation, and (c) provides the ‘platform’ for synthesizing them as interdependent theses (P&V strategy #4).

3.4.1 Holistic duality (comprehensive and systematic)

The holistic duality tenet of yin-yang concept posits that a complex phenomenon or entity cannot be complete unless it has two opposite but interdependent elements for its ‘spatial’ (Li, 2008; Li, 2011) and ‘temporal’ contents. In fact, this tenet provides the theoretical basis for the *general* acknowledgement identified in Chapter 2’s literature review that entrepreneurial opportunities are “combinations” (Grégoire, et al., 2010, p. 117) of the evolving interdependent market forces of *demand* and *supply*. The dualistic forces interrelate over time and space in various means, ends, or means-ends relationships (Eckhardt & Shane, 2003; Eckhardt & Shane, 2010, p. 51; Kirzner, 1997; Sarasvathy, et al., 2010, pp. 82, Table 4.1). To be precise, the deduction made in Paragraph (B) of Section 2.6.3.1 that entrepreneurial opportunity is ontologically a duality *nexus* of demand and supply antecedents is intrinsically a reflection of yin-yang’s holistic duality tenet. In accordance with the tenet, opportunity *cannot comprehensively exist* unless both its antecedents *exist*, and even then, may be potentially *unobservable*, *unknowable*, or *undetectable* to the entrepreneur in time and/or place; neither can opportunity be *systematically understood* temporally and spatially apart from its dualistic antecedents. Hitherto, extant understanding of entrepreneurial opportunity as a holistic duality of demand-supply (DS) or supply-demand (SD) nexus (see Paragraph (B) of Section 2.6.3.1) lacked a proper philosophical basis. This results in Paradox #2, which denies the existence of opportunity (and thus its antecedents), yet pre-supposes that it exists (along with its antecedents).

For the same reasons, the yin-yang concept can also be the philosophical basis that provides coherence, consistency, and rationality when explaining entrepreneurial process as a nexus between the *dualistic* constructs of opportunity and entrepreneur. In fact, the holistic duality tenet of yin-yang most accurately reflects Shane and Venkataraman’s (2000) conceptualization of the IO-nexus as “the interactive coming together of entrepreneur and opportunity” (Sarason, et al., 2006, p. 287), whereby the duality of the entrepreneur and opportunity constructs can exist *severally* but *not independently*. This contrast with the received view of the *objectivists*, which paradoxically turns the IO-nexus into an overlap of two *separate* and *unrelated* constructs (Paradox #1). It contrasts also with the *subjectivist* view, which relegates opportunity into a variable *dependent* on the individual, and hence obliterating the IO-nexus altogether.

3.4.2 Dynamic duality (temporal and evolving)

Yin-yang's dynamic duality tenet posits that the opposite elements of a complex phenomenon or entity are interactive and will mutually, but "[not] fully" (Li, 2011, p. 11) transform into each other. According to the dynamic duality tenet, the transformation happens *temporally* and *spatially* in a multi-phase, non-linear process of balancing under various conditions (Li, 2008; Li, 2011), involving "recursive interaction . . . and perpetually rebalancing actions" (Li, 2011, p. 11).

In the theoretical context, the dynamic duality tenet is consistent with Giddens' (1984) structuration theory and resembles Gersick's (1991) pattern of punctuated equilibrium²⁰. As shall be demonstrated below, it is also generalizable to:

- (a) account for the defining characteristics (transformational, multiplicity and malleability, and divisibility) of entrepreneurial opportunity,
- (b) explain the interactions between opportunity's demand and supply antecedents,
- (c) resolve the paradox highlighted by Chapter 2's literature review regarding opportunity's ontological nature (e.g., where it exists but nonobservable), and
- (d) elucidate the influence of opportunity in its interaction with the entrepreneur at the nexus of entrepreneurial process.

3.4.2.1 Defining characteristic: Opportunity's transformational nature (changing, evolving)

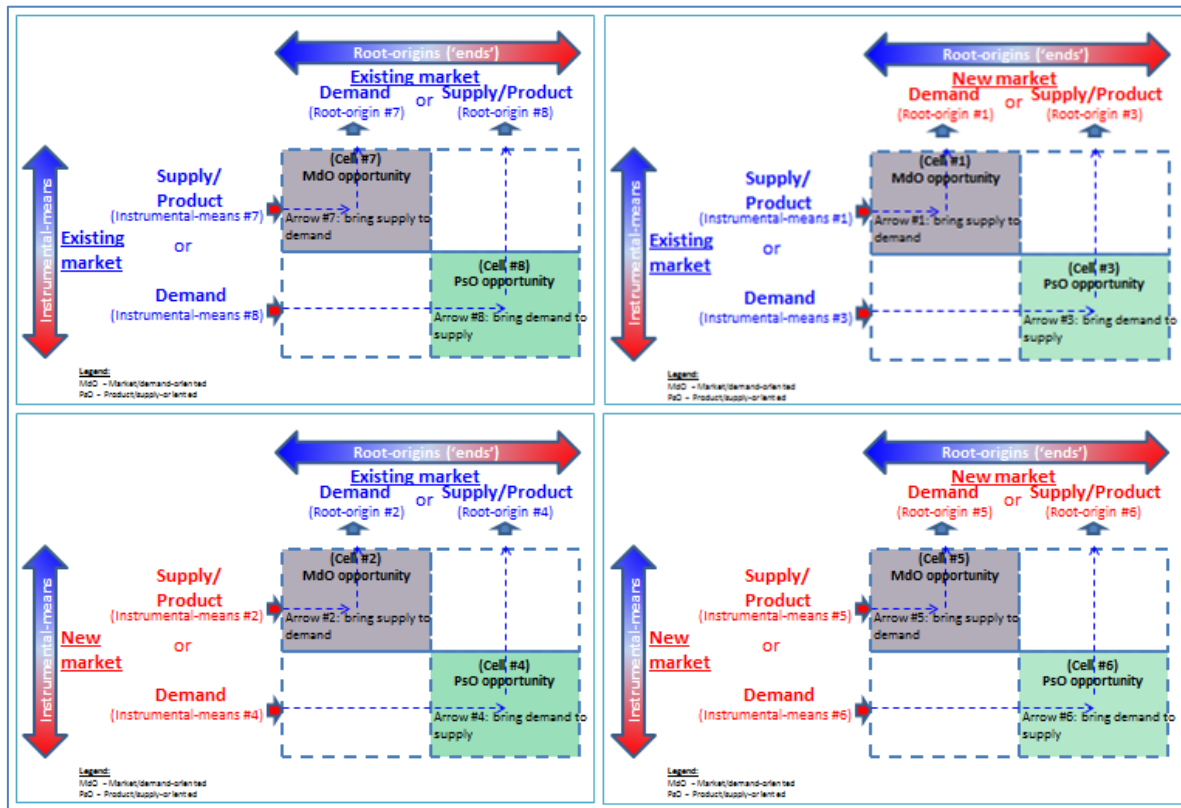
First, the tenet of dynamic duality provides the theoretical perspective (hitherto absent) on complex natural phenomena such as *market-opportunity*. This includes not only its changing *nature*, but also the *temporal* and *spatial* transformation characteristic of its dualistic antecedents (demand and supply), as well as the *sequential order* and *orientation* of how the transformation

²⁰ Gersick (1991) uses the term 'punctuated equilibrium' to conceptualize 'change' as "an alternation between long periods when stable infrastructures permit only incremental adaptations, and brief periods of revolutionary upheaval" (p. 10).

happens. For instance, the remarks of entrepreneurship scholars in extant literature, such as “the world does not stand still” (Dimov, 2011, p. 68), and the oft-discussed view in literature that economies operate in a constant state of disequilibrium (Schumpeter, 1934; Shane & Venkataraman, 2000), are generalizable analytically to the dynamic duality tenet. Implicit in such remarks is the dynamic duality tenet’s perspective of opposite elements in complex phenomena being involved in recursive interaction and perpetually rebalancing actions (Li, 2011, p. 11) over *space* and *time*. In fact, numerous extant definitions found in literature embody such a perspective, especially those that describe the nature of entrepreneurial opportunity as “progress[ive]” (Dimov, 2007b, p. 720) or changing, due to “market failure” (Grégoire, et al., 2010, p. 117) and “imperfections” (Alvarez & Barney, 2010, p. 559; Alvarez, et al., 2013, p. 302). See also Table 2.1: 8, 10, and 12. As mentioned in Paragraph (C) of Section 2.6.3.1, the various types of imperfections that cause disequilibrium in the marketplace ultimately manifest as changes in demand or supply, which in turn *orientate* the adjustments in supply or demand respectively. The rebalancing process between demand and supply re-establishes market equilibrium. From the dynamic duality tenet’s perspective, it is the state/manifestation (be it yin or yang) of the respective dualistic market elements that “will mutually transform into each other in a process of balancing” (Fang, 2012a, p. 26) in ends-means interactions *temporally* and *spatially* under different yin-yang environments or market situations. Giddens’ (1984) structuration theory is representative of such a view, as it posits that two separate constructs can be “intricately interlaced with their respective attributes being a function of the effect of one on the other” (Sarason, et al., 2006, p. 293).

Paragraph (B) of Section 2.6.3.1 reported that demand and supply forces are in fact the antecedents of opportunity. Per Paragraph (C)(1) of Section 2.6.3.1, where the root-origin of opportunity is triggered by *changes* in product-supply that either already *exists* or is *new* (i.e. soon to emerge, albeit may yet be ‘unobservable’ temporally and spatially to consumers and competitors), demand will be the instrumental-means for entrepreneurial process to resolve the supply ‘disequilibrium’ as the ‘outcome’ for the venture. The *transforming* of demand to meet product-supply as the venture-outcome to restore the yin-yang equilibrium would be a product/supply-oriented (PsO) phenomenon explainable by the dynamic duality tenet (see the green-colored cells in Figure 3.2).

Figure 3.2 – Dynamic interactions of dualistic demand and supply forces



Conversely, Paragraph (C)(2) of Section 2.6.3.1 illustrates the situation where a *change* in demand (whether currently existing or yet to manifest) is the triggering root-origin of market failure. The opportunity will need to be addressed by supply (existing or new/emerging) which in practice must offer product-attributes (such as price, features, or both) that fit the market needs/wants as the *outcome* for the venture (see the purple-colored cells in Figure 3.2). The *formation* or *transformation* of product-supply to meet demand as the venture-outcome and restore the yin-yang equilibrium would be a demand or market-oriented (MdO) phenomenon explainable by the dynamic duality tenet (see the purple-colored cells in Figure 3.2).

Summarizing, the review of extant literature in Chapter 2 reveals the ends-means (and means-ends) interactions of demand and supply under various disequilibrium market scenarios or yin-yang situations whether existing or new/emerging. This revelation is analytically generalizable to the yin-yang philosophical paradigm's dynamic duality tenet, which views the interactions as natural phenomena of evolving changes in demand and supply over time and space. The

interactions give rise to different yin-yang configurations or types of opportunity (discovery, constructionist, and creation). The review of extant literature also reveals the opportunity's root-origin as the *orientator* of entrepreneurial process taken to form and exploit the opportunity.

3.4.2.2 Defining characteristics: Opportunity's malleability & multiplicity

Second, numerous observations made by entrepreneurship scholars are generalizable analytically to the dynamic duality tenet that explains the *transformation* of the states/manifestations (yin or yang) of opportunity's dualistic antecedents (demand and supply), and thus opportunity itself:

“Entrepreneurial opportunities come in a variety of forms.” (Shane & Venkataraman, p. 220)

“Entrepreneurial opportunities must have vast ontological differences . . .” (Ramoglou & Tsang, 2016, p. 417)

This *multiplicity* characteristic of market-opportunities ultimately reflects their malleable and divisible nature, which in turn explains the phenomenon of new venture ideas “being often in rudimentary and malleable form” (Davidsson, 2015, p. 685). From the yin-yang perspective, the defining characteristics of multiplicity, malleability, and divisibility mentioned by research scholars match the dynamic duality tenet's notion – that is, that the changing states or manifestations of opposite elements of a complex phenomenon (like the antecedents of market-opportunity) reflect their transformation in a non-linear multi-phase process over time and space.

3.4.2.3 Defining characteristic: Opportunity's divisibility

Third, the *divisibility* characteristic of *market*-opportunities is generalizable analytically to the yin-yang concept and its dynamic duality tenet. For instance, Venkataraman and Sarasvathy (2001) mention that “only a *subset*” (pp. 4, footnote 2, emphasis added) from the spectrum of *multiple possibilities* inherent in a *market*-opportunity in the marketplace is introduced by a startup-venture. At the firm level of analysis, the *entrepreneurial* opportunity or *venture-opportunity* of a particular startup-venture represents only an aspect or subset of the much

broader market opportunity-*possibility* that exists in the marketplace. The attributes of *market* demand and supply antecedents that comprise the market-opportunity are much *wider* than those of the multiple subsets of entrepreneurial venture-opportunities having economics (favorable or unfavorable) over a continuum mustered by different entrepreneurs individually.

“[F]or any given new technical invention there are, at least in theory, an infinite number of product possibilities that may flow out of that invention. [. . .] Indeed, a large number of new products are introduced into the economy by new firms.” (Venkataraman & Sarasvathy, 2001, pp. 4, footnote 2).

Reframing the scholars’ observation, an *entrepreneurial venture*-opportunity is one among multiple subsets of the macro combination of market demand and product-supply *possibility* that is unique to a particular startup-venture. A venture-opportunity *possibility* thus shares the same *macro* root-origin which triggered the market-opportunity (see Paragraph (C) of Section 2.6.3.1); but at the same time, a venture-opportunity can be shaped or divided out as a *subset* from among many possibilities of the market-opportunity. Each venture-opportunity pursued and enacted by the individual agency of different entrepreneurs at the nexus of entrepreneurial process can thus be different, because the market-opportunity to which each venture-opportunity relates is a much *bigger* and *broad*er phenomenon in terms of time and spatial dimensions at the macro level.

The characteristics of entrepreneurial venture-opportunity being a subset of market-opportunity as revealed from the above discussion are also expressed by numerous scholars. For instance, Dutta and Crossan (2005) observe that “the introduction of *one or more* new products or services in the marketplace” (pp. 426, emphasis added) is needed to satisfy the market-opportunity. Many (but not all) firms may want to introduce the needed product or service in various forms and a startup-venture is only one among them. Venkataraman and Sarasvathy (2001) add:

“[I]n practice, only a finite subset of [product] possibilities come into existence.” (pp. 4, footnote 2).

Their comment suggests on the one hand that only a *segment* or *niche* (as commonly described in marketing literature) of the *total* market is typically served by the entrepreneurial opportunity of

a startup-venture. On the other hand, the comment implies a situation of market disequilibrium, which gives rise to recursive interaction and perpetually rebalancing actions (Li, 2011) generalizable analytically to the dynamic duality tenet as a natural marketplace phenomenon.

3.4.3 Dialectical duality (paradoxical and dualistic)

Dialectical duality tenet is related to the logic of paradox (Lado, et al., 2006; Lewis, 2000; Poole & Van de Ven, 1989). In contrast to the ‘opposite-in-conflict’ logic of dualism, the dialectical duality tenet of yin-yang notion embodies the spirit of *yin* and *yang* as “opposites-in-unity” (Li, 2008, p. 416). The dialectic duality tenet exists because of (a) the *interdependence* and complementary synergy between the opposites to mutually affirm (tied to the holistic duality tenet for equilibrium), and (b) the tradeoff between the opposites to mutually negate (tied to the dynamic duality tenet for punctuated equilibrium) (Li, 2008), as the ‘opposites’ interact and transform themselves over space and time. As much as the dialectical duality tenet is anchored on its counterpart holistic and dynamic duality tenets of a complex phenomenon (Li, 2008; Li, 2011), the latter two tenets cannot exist reciprocally absent the former.

Collectively, the three tenets complete the ‘both/end’ thinking of the yin-yang duality which regards paradoxical tensions and contradictions *not* as exclusive opposite ‘either/or’ problems per Western logic of paradox (Chen, 2002), but a natural way of life, a world view, and a methodology (Chen, 2002; Chen, 2008; Fang, 2012a, p. 36; Li, 1998; Li, 2008). To a great extent, all paradoxes, dilemmas, or trade-offs (like the *demand-supply* antecedents of opportunity, and the *individual-opportunity* nexus of entrepreneurial process) can be reframed and recontextualized into yin-yang dualities (Li, 2011) as an *integrative*, *holistic*, and dynamic approach to problem-solving (Chen, 2002; Fang, 2012a, p. 32; Li, 2008; Li, 2011, p. 11).

3.4.3.1 Objective existence and nonobservability: Paradox #2 resolved

From the yin-yang perspective, opportunity does exist as an objective and complete dualistic phenomenon in the marketplace with demand and supply as its two antecedents (tied to holistic and dialectical duality tenets, see [Section 3.4.1](#)). As pointed out in [Section 3.4.2.3](#), *market-*

opportunity is holistically much bigger than the particular venture-opportunity undertaken at the *micro* level by a startup-venture. While market-opportunity exists as a macro objective reality, it is malleable and divisible ([Section 3.4.2.2](#) and [Section 3.4.2.3](#)) because of the multiplicity and transformational nature of its dualistic antecedents (tied to dynamic duality tenet, see [Section 3.4.2.1](#)). These ontological characteristics *operationalize* the opportunity construct for *interaction* with the startup-venture's entrepreneur, enabling him/her to form and then exploit his/her *venture-opportunity* as an *unique subset* or sub-aspect of the bigger market-opportunity *possibility*, which may be unobservable, unknowable, or undetectable in whole or in part.

Consequently, by reframing extant teleological explanations on the epistemological formation of opportunities in the context of yin-yang duality concept, the constructionists and evolutionary-realists can absolve themselves of Paradox #2 that stems from their subjectivist denial of the existence of opportunity while implicitly having to pre-suppose its existence. From the standpoint of the yin-yang, opportunity does not need to be subordinated as a dependent outcome of entrepreneur's construction or creation; it can co-exist and interact *interdependently* (dialectical duality tenet) with entrepreneur in the *dualistic* IO-nexus of entrepreneurial process.

3.4.3.2 Interdependence of opportunity and entrepreneur in the IO-nexus: Paradox #1 resolved

Rationalizing the characteristics of opportunity (as being transformational, capable of assuming multiple forms, malleable, and divisible) with the help of the three yin-yang duality tenets provides room to reframe 'opportunity' as an objective construct that exists and interacts *interdependently* with the entrepreneur counterpart in the dualistic IO-nexus of entrepreneurial process. This resolves Paradox #2 of the subjectivist position, which denies but requires the existence of opportunity. The interdependent relationship that happens between the opportunity and entrepreneur also palliates Paradox #1 of the objectivist logic which turns the IO-nexus that it acknowledges as a dualistic notion into a mere overlap of opportunity and entrepreneur as separate, distinct, independent, and unrelated constructs. A simple overlap does exist when the strictest form of objectivist logic applies, as in the case of matured markets where equilibrium situation prevails, so that demand and supply are *given* and *immutable*. Opportunity thus becomes an 'arbitrageable' *discovery* opportunity that is already instituted in existing market

structure, where the “existing, ongoing market processes and relationships remain unperturbed” (Dimov, 2011, p. 68). For the discovery entrepreneur, it will be “business as usual” (Dimov, 2011, p. 68).

3.4.4 Section summary

Extant views in literature regarding the ontological nature of opportunity in terms of its existence and defining characteristics can appropriately be reframed and generalized to the yin-yang duality philosophical paradigm. The ‘both/and’ perspective of the yin-yang duality concept provides the metatheoretical basis needed to operationalize the opportunity construct as a dualistic DS or SD nexus, which in turn substantiates Shane and Venkataraman’s (2000) notion of entrepreneurial process being a dualistic IO-nexus phenomenon where opportunity interacts dynamically with the enterprising individual. Just as the dualistic antecedents (demand and supply) of the opportunity construct are interdependently related, the opportunity construct and its entrepreneur counterpart in the IO-nexus are likewise co-existing, co-dependent, complementary, and synergistic (holistic and dynamic duality tenets), despite having distinct nature and characteristics of their own (dialectical duality tenet). Rationalizing the phenomena of opportunity and therefore the IO-nexus with the yin-yang notion is thus *unlike* the ‘either/or’ dialectic objectivist (*yang*) position which can cause opportunity and the individual to be construed as two overlapping independent constructs, or the subjectivist (*yin*) position which subordinates opportunity to the individual.

In extant works, there often are occasions when researchers, knowingly or unknowingly, make comments that corroborate with the spirit of yin-yang’s duality concept, such as the following by Dimov (2011):

“[T]he entrepreneur will be actively engaged in market relationships [between demand and product-supply] . . . Through these footprints an opportunity becomes realized . . . [and] moves from being a product of the aspiring entrepreneur’s imagination to becoming a self-sustaining, organized set of market exchange activities that gradually becomes independent of its progenitor.” (Dimov, 2011, p. 68)

“[T]he actions through which an opportunity is expressed can be seen as directed toward forging exchange [or transforming demand and supply] relationships in the marketplace that collectively constitute an emerging venture.” (p. 69)

Inherent in Dimov's (2011) comments is the subjectivist perspective that regards opportunity as an organized set of market demand and supply exchange activities forged by the entrepreneur from his/her imagination. When generalized to the yin-yang universe, Dimov's (2011) imagination (or imagined opportunity) that “becomes [an opportunity] independent of” (p. 68) the entrepreneur *a posteriori* is synonymous with an opportunity that *exist ex-ante* in the yin-yang universe with demand and supply antecedents unobservable, unknowable, or undetectable (and therefore appear ‘non-existent’) to the entrepreneur *prior to* the start of the entrepreneurial process. To be an “progenitor” (p. 68), the entrepreneur will need imagination to enact the IO-nexus of entrepreneurial process for the yin-yang *states/manifestations* of opportunity to become observable, knowable, and detectable over time, even as the demand and supply antecedents themselves change temporally and spatially (Sections 2.6.3.1(C)(1) and (C)(2)). The *interdependency* between (a) the demand and supply antecedents that forms opportunity as a *dualistic* DS or SD nexus, and (b) opportunity and the entrepreneur as constructs in the *dualistic* IO-nexus of entrepreneurial process, *adds* dynamism to entrepreneurship's *biology* (Cardon, Zietsma, Saporito, Matherne, & Davis, 2005).

Summing up, the yin-yang concept with its three duality tenets makes plain the views and discussions in extant literature regarding the phenomenon of *opportunities*, their defining characteristics as *dualistic* DS or SD nexuses of various yin-yang configurations that reflect different market conditions, as well as the interactions between opportunity's antecedents of demand and supply. The ‘both/and’ perspective of yin-yang notion *also* lends philosophical support to the phenomenon of *entrepreneurial process* as a *dualistic* IO-nexus of interdependent interaction between opportunity and the enterprising individual, thereby resolving the paradoxes that handicap the explanations of the objectivists and subjectivists. Moreover, the yin-yang duality concept reveals the *orientation* (either PsO or MdO) of the entrepreneurial process as being determined by the opportunity's root-origin, which a startup-venture needs to heed when forming and exploiting its opportunity.

3.5 Development of the conceptual O-O-P framework

3.5.1 Core metatheoretical paradigm

This thesis adopts the yin-yang duality concept as the alternative metatheoretical perspective (a) to provide the dimensions of consistency and coherence currently lacking in extant entrepreneurship literature (Alvarez, et al., 2010), and (b) for the conceptual O-O-P framework to visualize and operationalize the IO-nexus notion in delivering a single integrated theory on start-up entrepreneurship. To provide theoretical and practical value, the chapter sub-sections that follow explain the conceptual O-O-P framework, including the orientation and causal ends-means linkages among the variables, such as the antecedents and *a priori* venture-outcome that drive the entrepreneurial process to achieve the particular opportunity pursued by a new venture.

3.5.2 Entrepreneurial opportunities as objective dualistic DS/SD-nexuses

As McMullen, et al. (2007) exhorts:

“The challenge of establishing anything close to an interdisciplinary consensus regarding opportunity notwithstanding, it may be far more important for scholars to simply take a stance on this issue and then clearly articulate their position and definition of what is and is not an opportunity.” (p. 279)

Indeed the conceptual O-O-P framework cannot be developed without defining what the words ‘entrepreneurial opportunity’ (or ‘venture-opportunity’) means. In turn, Venkataraman and Sarasvathy (2001) emphasize that:

“[I]f we are to understand entrepreneurial opportunities, we have to delve into the preconditions for their existence.” (pp. 8, emphasis added)

Basing on the yin-yang duality philosophical paradigm as heretofore discussed, the phenomenon of entrepreneurial opportunity in the conceptual O-O-P framework can be defined and understood as follows:

Entrepreneurial opportunity is an objective reality (albeit may be unobservable, unknowable, and undetectable to the individual entrepreneur) having its ontological existence as a nexus of the dualistic forces of demand and supply in the marketplace characterized by a state of disequilibrium or yin-yang condition.

This definition incorporates “the preconditions for the existence of demand and supply combinations that constitute entrepreneurial opportunities” (Venkataraman & Sarasvathy, 2001), which can be justified with a philosophical position such as the yin-yang duality concept.

3.5.2.1 Objective existence

The yin-yang concept provides the core logic to support notion that entrepreneurship involves the dualistic nexuses of (a) demand and supply comprising entrepreneurial opportunity, and (b) individuals and opportunities interacting in the entrepreneurial process. As Shane (2012) stresses:

“[T]he idea that opportunities . . . are objective is not a semantic point . . . objective opportunities must be a central part of the explanation of the opportunity-based [IO-nexus] perspective on entrepreneurship that researchers have been developing over the past decade.” (p. 16)

As pointed out in Paragraph (B) of Section 2.6.3.2, if entrepreneurial opportunity (such as in a constructionist setting) is a dependent variable enacted by the entrepreneur as the subjectivists argue, “*both opportunities and individuals are a function of individuals, then no nexus exists*” (Shane, 2012, pp. 16, italics added for emphasis). If opportunity does not have an objective existence, then theorizing ‘entrepreneurship’ will be incoherent and chaotic, and paradoxes can arise when explaining opportunity’s formation and exploitation epistemology as discussed in Chapter 2. It can lead subjectivist scholars like Klein (2008) to suggest “*drop[ping] the concept of opportunity altogether*” (pp. 183, italics in original text), because:

“Opportunities for entrepreneurial gain are . . . inherently subjective – they do not exist until profits are realized.” (pp. 181, emphasis added).

As Shane (2012) notes, the drawback to such a subjectivist view is that “unsuccessful entrepreneurship is a logical impossibility” (p. 16), and ‘NVI’ would then rightfully substitute ‘opportunity’ as a label because the latter connotes a favorable event that only manifests itself *ex-post* to the completion of entrepreneurial process (Davidsson , 2015). Equally, ‘entrepreneur’ also becomes an *ex-post* label that describes individuals having opportunities that are determined to be successful and profitable on an *ex-post* basis. These views clearly do not accord with mainstream definitions of ‘opportunity’ and ‘entrepreneur,’ or the empirical reality of start-up failures (Amit, et al., 1999; Stangler & Litan, 2009). Moreover, if left to the entrepreneur’s “imagination” (Klein, 2008, p. 183), conceptualizing and operationalizing entrepreneurship as a *process* will be difficult if not impossible. Absent opportunity, there will be no object to provide purpose, direction, or orientation to guide the entrepreneurial process. All aspects of entrepreneurship will take on a person-centric perspective, thereby “systematically overestimat[ing] the importance of individual characteristics” (Shane, 2012, p. 17) and *failing* to explain and “represent entrepreneurship as a *process* rather than an . . . embodiment of a type of person” (Shane, 2012, p. 18, with emphasis).

As Shane (2012) observes, *unsuccessful* entrepreneurship can and do exist in practice:

“[O]bjective opportunities [that exist] make it possible for entrepreneurs to formulate subjective new business idea, which are subjective and uncertain.” (p. 16)

Such an observation resonates with the tenets of holistic duality and dynamic duality (with regard opportunity’s multiplicity, malleable, and divisible nature) of the yin-yang concept, as they allow opportunity (profitable or otherwise) to exist and interact with the entrepreneur interdependently (dialectical duality tenet) as ‘idea,’ because opportunity may be unobservable, unknowable, and undetectable. The yin-yang notion thus provides the metaphilosophical basis for the conceptual O-O-P framework of this thesis to operationalize the opportunity construct for the IO-nexus to be a holistic, dynamic, and dialectical but interdependent dualistic notion:

“[It] preserve[s] the ideas that entrepreneurship can be unsuccessful and that entrepreneurship depends on the [IO] nexus of people and opportunities.” (Shane, 2012, p. 16)

3.5.2.2 Dualistic nexuses in opportunity-hexadecadrant

Other than having an objective existence, entrepreneurial opportunities are dualistic nexuses of demand and supply elements interacting in various ends or means relationships under market disequilibrium situations. In other words, an entrepreneurial opportunity comprises demand and supply elements that “may be generalized along two dimensions [as ends or means]” (McMullen, et al., 2007, p. 277). They coexist to form opportunity (tenet of holistic duality), albeit as opposite (relatively contradictory) but interdependent (relatively compatible) elements that mutually negate (for completeness and punctuated shift) and mutually affirm (for consistency and equilibrium), becoming “opposites-in-unity, a tenet of dialectic duality” (Fang, 2012a, p. 26; Li, 2008, p. 416; Li, 2011, p. 11) in the nexus of ends-means relationships. If either one of the dualistic elements is missing, there will be no opportunity; neither will the IO-nexus exist. As Ramoglou and Tsang (2016) remark, “[*Without opportunities*]’ pre-existence it is *impossible* for an entrepreneur to profit” (pp. 415, italics in original text), albeit Chapter 2’s literature review notes that profitability is not a ‘given.’

Shane’s (2012) “LEOAir” is a good example where the opportunity for air service “*did not exist* in Renaissance Italy, given the level of scientific advance *at that time*” (pp. 16, emphasis added). Even if demand existed, the business would simply be a subjective imagination that is “technically and commercially impossible” (Davidsson, 2015, p. 687) without the aviation technology for the opportunity to exist as “an *objective* phenomenon *independent* of what Da Vinci *thought*” (Shane, 2012, pp. 16, emphasis added). Ramoglou and Tsang (2016) note, “Reality imposes constraints on what should be accepted as plausible knowledge” (p. 413). The state of technology then prevailing was such that the business “could not be ‘enacted’ – that is, brought into existence by talking about it” (Shane, 2012, pp. 16, citing Weick, 1969). Much later of course, air travel did evolve into an opportunity in tandem with *objective* environmental forces that advanced science and technology. The market also became willing. Regardless, if one of the dualistic elements is missing, ‘opportunity’ cannot exist; neither will there be an IO-nexus. The nexus of entrepreneurial process between the entrepreneur and opportunity cannot happen.

Shane's (2012) "LEOAir" example also helps to highlight the dynamic duality tenet's allusion to the transformation phenomenon which characterizes the ends-means relationships between dualistic elements asserting influence on each other "in a process of balancing under various conditions" (Fang, 2012a, p. 26). These "various conditions" (Li, 2008, p. 416) represent imperfections/imbances in the market. They entail changes in the states/manifestations (whether yin or yang) of demand and/or supply (see Paragraph (C) of Section 2.6.3.1), where demand or product-supply is the *root-origin* (the *de facto* 'ends') interacting with the counterpart product-supply or demand respectively as *instrumental-means* to form different opportunity-types as DS or SD *nexuses*. Figure 2.2 shows these ends-means relationships in different scenarios of *market states* or *yin-yang conditions*, under which the balancing, rebalancing, and transformation of the demand and supply elements of entrepreneurial opportunities take place. These market settings or yin-yang environments can be:

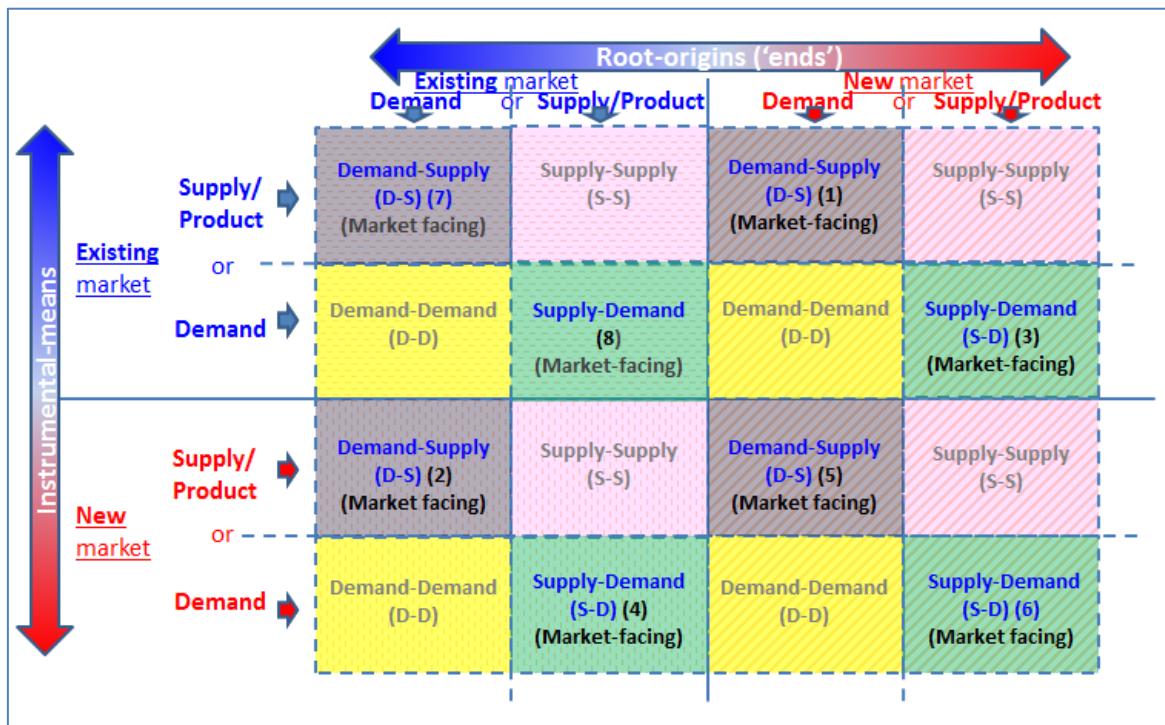
- (a) ***within*** existing markets, where conditions are observable;
- (b) ***within*** new/emerging markets, where conditions are unclear, ambiguous, and/or unobservable; or
- (c) ***as between*** (or 'inter') existing and new/emerging markets, where conditions are partly unobservable either on the demand-side or supply-side.

Based on the various possible interactions between demand and product-supply in dualistic ends-means and means-ends inter-relationships under different market-settings/yin-yang environments, there can be 2^3 or eight different demand-supply (**DS**) and supply-demand (**SD**) opportunity-nexuses.

3.5.2.3 Opportunity-hexadecadrant: Operationalizing the 'opportunity' construct

Graphically, the nexuses can be represented by stacking together the dynamic interactions between the dualistic demand and supply forces as illustrated in Figure 3.2 to produce an integrated 4x4 matrix-grid of *opportunity-cells*, or **opportunity-hexadecadrant** as is known in this thesis. Figure 3.3 shows the opportunity-hexadecadrant.

Figure 3.3 – Hexadecadrant or matrix-grid of demand and supply relationships



Whereas the yin-yang duality concept provides the theoretical position to explain the ontological nature of opportunity, the opportunity-hexadecadrant serves as a parsimonious tool to visualize and operationalize opportunities as DS, SD, demand-demand (**DD**), and supply-supply (**SS**) constructs in different configurations of yin-yang manifestations. Specifically, as will be discussed in Paragraph (A) of Section 3.5.2.3, the opportunity-hexadecadrant not only helps to categorize opportunities into the different ‘types’ familiar in extant literature (discovery, constructionist, and creation), but also identify and profile them along a number of distinguishing dimensions. The dimensions include:

- (a) the sources of change or environmental factors that trigger the root-origins (either demand or supply, with different possible yin or yang states/manifestations) of the respective opportunities,
- (b) the ‘level’ of entrepreneurship associated with each opportunity in terms of the degree of innovation, risk, and uncertainty characteristics, and

- (c) the orientation of the entrepreneurial process taken to form each opportunity by bringing the instrumental-means to match their root-origins.

(A). *Multiple opportunities*

The opportunity-hexadecadrant *visualizes* and *operationalizes* the opportunity construct by providing specificity and clarity hitherto lacking in literature regarding the idea that there may be *multiple forms of opportunities* (Alvarez & Barney, 2007; Sarasvathy, et al., 2010; Shane & Venkataraman, 2000). In fact, the opportunity-hexadecadrant in Figure 3.3 shows 16 different opportunities as represented by the opportunity-cells. Each of the opportunity-cells in Figure 3.3 represents an opportunity ‘set’ in a particular market or yin-yang environment represented by the opportunity-quadrant where it is in. (Note: multiple entrepreneurial venture-opportunities can develop as *subsets* of the market-opportunity ‘set,’ as will be discussed below)

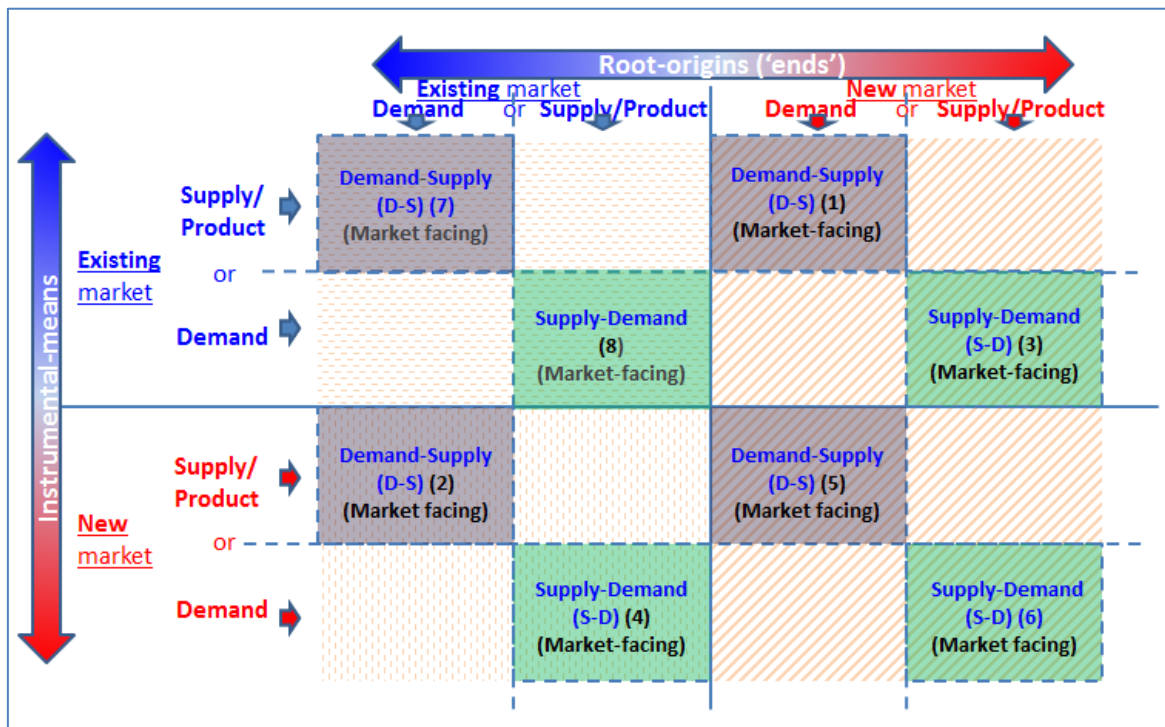
Of the 16 market-opportunities, eight fall outside the scope and focus of this thesis. Four of them are SS interactions indicated by the pink-color opportunity-cells in Figure 3.3. Venkataraman (1997) refers to them as opportunities in the “factor markets, as in the discovery of new materials” (Shane & Venkataraman, 2000, pp. 220, citing Schumpeter. 1934). Their antecedents, whether root-origin and instrumental-means, are supply-based and relate to the entrepreneur’s interaction as a *producer* with other producers in the *factor* marketplace, where his/her product affects or is affected by other products. Such situations involve innovation, technology, packaging, and so on (Von Hippel, 1988).

Another four opportunity-cells in Figure 3.3 are DD interactions as shown by the yellow-color opportunity-cells. They constitute social interactions among consumers, where the tastes and preference of some individuals may have a ‘contagion’ effect on others. The patterns of interactions can provide useful information to entrepreneurs when developing ‘early adopter’ or ‘lead user’ strategies for their startup-ventures (Moore, 2014; Von Hippel, 1986). In the context of this thesis, consumers *per se* are not regarded as ‘entrepreneurs,’ although their actions and preferences can trigger market imbalances from the demand-side as the antecedent root-origin of opportunity.

As indicated in Figure 3.3, of interest to this thesis' conceptual O-O-P framework are the eight market-facing DS and SD opportunity-nexuses that an entrepreneur can form and exploit by the process of bringing the instrumental-means to match the root-origins. In accordance with the tenet of dynamic duality, these DS and SD market-opportunities (represented by the opportunity-cells colored in purple and green in Figure 3.3's opportunity-hexadecadrant) are malleable and divisible into opportunity-*subsets* (see [Section 3.4.2.3](#)). The subsets are what Venkataraman (1997) would call *entrepreneurial opportunities* (**venture-opportunities**) of startup-ventures in the "product markets" (Shane & Venkataraman, 2000, p. 220).

Venture-opportunities would be similar to the opportunities Bhawe (1994) found in his empirical study that are "recognized and evaluated by entrepreneurs *with respect to markets*" (pp. 236, emphasis added). Transcribed and presented in Figure 3.4, *venture-opportunities* are subsets of market-opportunities, which are "objective situations" (Comanys & McMullen, 2007, p. 303).

Figure 3.4 – Hexadecadrant of DS and SD market-opportunities



In general, the DS opportunity-types are the more familiar phenomena. They are opportunities where a new venture attempts to achieve sustainable advantage by responding to market demand with product-supply as the instrumental-means. While the SD opportunity-types are less familiar, they are quite common in the history of technology entrepreneurship where products/solutions are *first* innovated to *then* search for markets that have *not* yet emerged or translated into demand (e.g., opportunity-cell 6 in Figure 3.4). According to the tenets of holistic and dynamic duality, such types of SD-opportunity can present vexing challenges since “the market does not exist, or is being radically redefined” (Schindehutte, Morris, & Kocak, 2008, p. 5).

The appearance of SONY Walkman in 1979 is an example of SD-opportunity. Initially, there was no apparent need for it when SONY’s audio-division engineer, Mr. Nobutoshi Kihara, built an audio product for the pleasure of his company’s co-founder, Mr. Masaru Ibuka. As things turned out, his creative imagination led to the Walkman product being successfully marketed.

Another example is PARC, a Xerox company known for its open innovation practices. It created the graphical user interface (**GUI**), but Steve Jobs and Wozniak took advantage of it to tap potential demand for their Macintosh computer

(B). Environmental forces

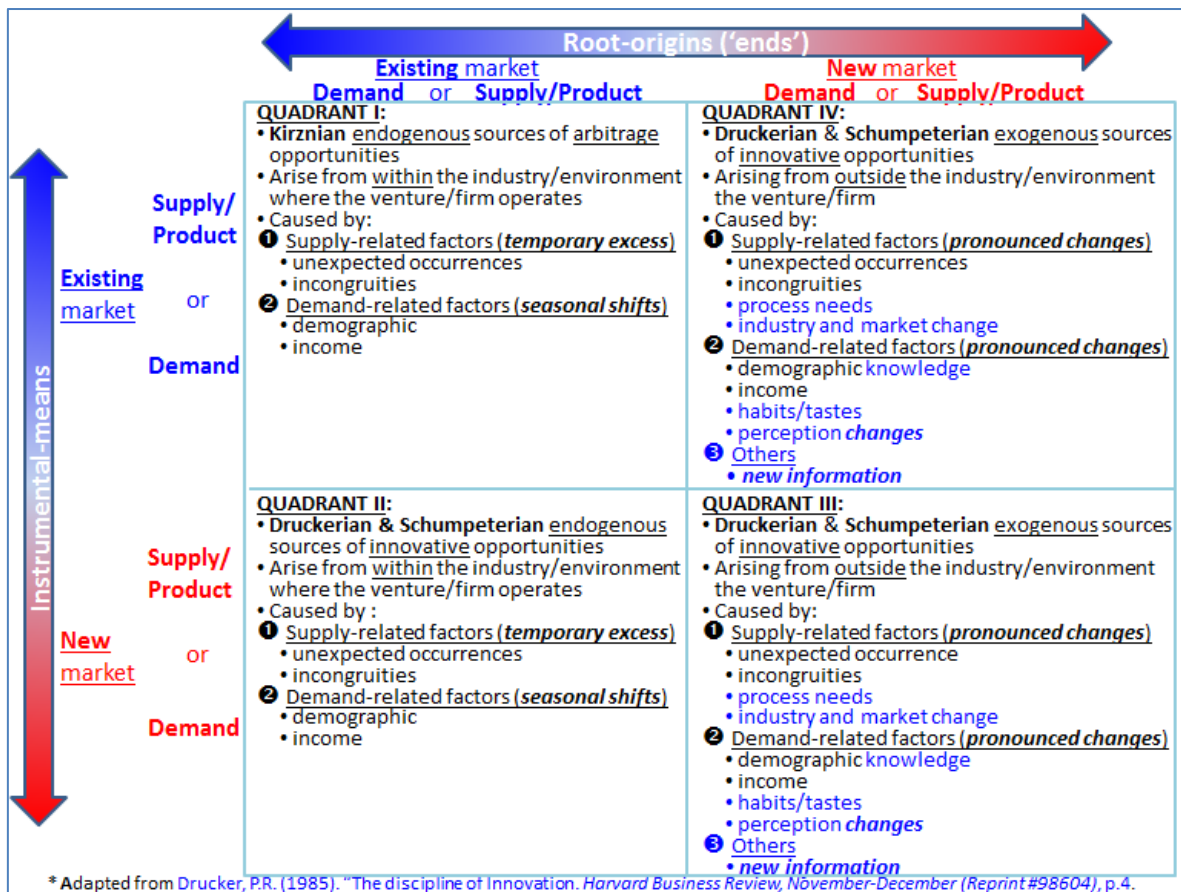
As mentioned in Section 2.4’s literature review, one of the criticisms against the IO-nexus notion is its failure to recognize “environmental forces as important antecedents to entrepreneurial activities” (Zahra & Dess, 2001, p. 9). Few scholars would reject the idea that objective sources of change emanating from the environment (like scientific advance, political, and regulatory changes, and demographic and social shifts) do influence opportunities. These environmental forces are familiar in extant literature (Bhave, 1994; Drucker, 1985b; Kirzner, 1997; Schumpeter, 1934; Van de Ven, 1986), and be categorized as demand and/or supply related. They create imbalances or failures in the market that “make it possible to introduce . . . resource combinations” (Shane, 2012, p. 15).

In their defense, Shane and Venkataraman (2001) acknowledge that environmental forces are important but only as *second-order* forces in explaining entrepreneurship. They reason that individuals and opportunities hold sway as the “*first-order* forces” (pp. 14, emphasis added) in the IO-nexus of entrepreneurial process. Nonetheless, in the yin-yang philosophical context of the conceptual O-O-P framework, the contention regarding environmental forces in the IO-nexus can be amicably resolved even without relegating them to a secondary position. The reason is that environmental forces are by default *operationalized* in the IO-nexus when they are the systemic sources/causes or antecedent root-origins of the opportunity construct. Such environmental forces manifest themselves as demand and supply interacting variously as root-origin or instrumental-means in different yin-yang configurations of market scenarios to form *nexuses* that represent *multiple forms of opportunities* (Alvarez & Barney, 2007; Sarasvathy, et al., 2010; Shane & Venkataraman, 2000) as shown in the opportunity-hexadecadrant.

As alluded to in Paragraph (C) of Section 2.6.3.1, the environmental sources of change manifesting as demand forces include demography, income, habits/tastes/moods, and perception and new knowledge. They can open up for market-opportunity possibilities, “which allows for . . . products to be introduced” (Dimov, 2003, pp. 413-414), such as offering biodegradable dishwashing detergent for the environmentally conscious homemakers. Supply-side sources of change that trigger opportunities include unexpected occurrences, incongruities, process needs, industry and market changes, and knowledge (e.g. technology).

Figure 3.5 provides a visual illustration on these sources of change manifesting themselves in various assortments through the antecedent root-origins (either demand or supply) of the different opportunities under distinct market-settings.

Figure 3.5 – Demand and supply related sources of change that generate market imbalance



In general, the root-origins or sources of change relating to demand or supply that generate market imbalances (and therefore opportunities) can be contextualized as either *endogenous* or *exogenous* depending on the market setting *where* a startup-venture operates. If the change (demand or supply) originates *internally* from *within* the *existing* market where a new venture operates, it is categorized as *endogenous* as shown in the left-hand column of Figure 3.5.

Conversely, changes originating in new markets outside the startup-venture's theater of operation (i.e., *new* to the venture) are contextually *exogenous* as shown on the right-hand column of Figure 3.5.

Whether originating endogenously or exogenously, the demand or supply changes provide opportunity for a startup-venture to *respond* by bringing the appropriate instrumental-means (supply or demand respectively) to meet the root-origin or cause of the changes. The

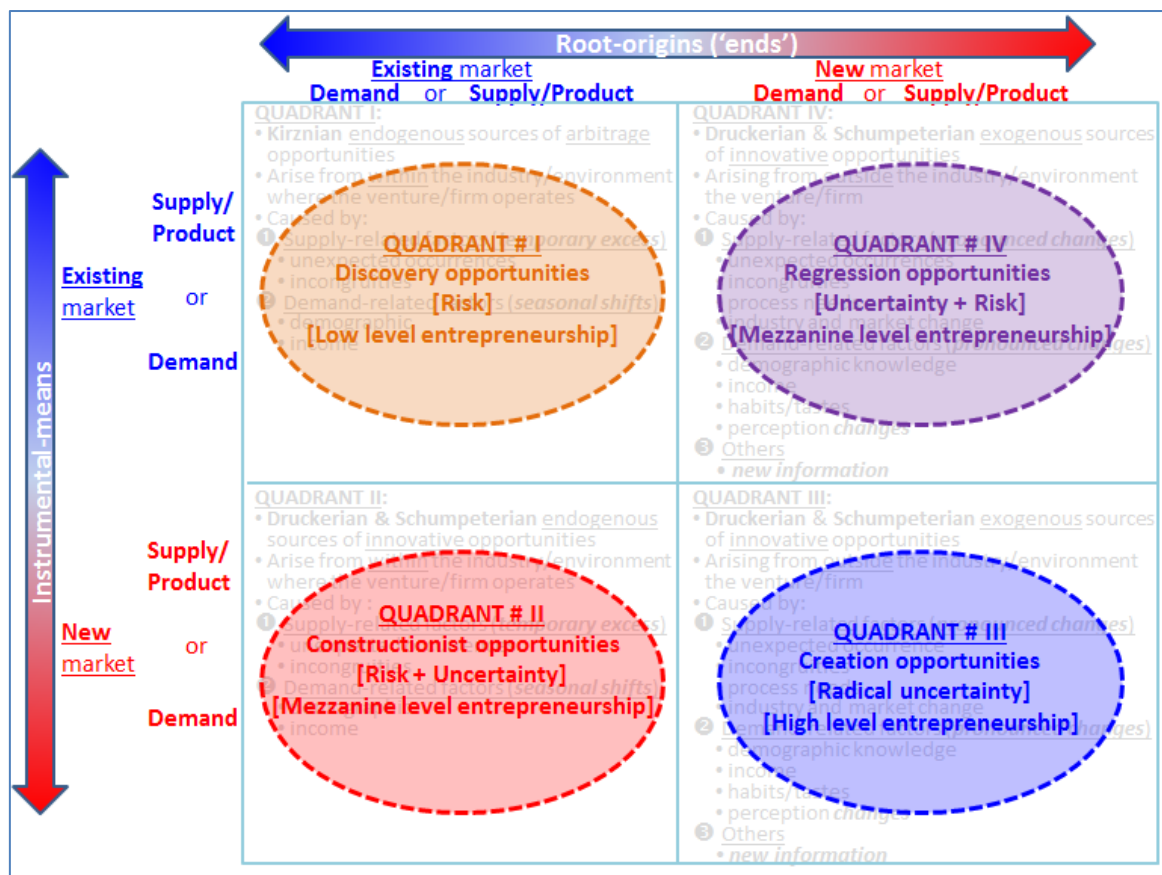
instrumental-means that is brought from *within/intra existing market* to meet endogenous or exogenous changes with root-origins in existing or new market respectively constitutes the more common or milder form of adjustment needed (per Quadrants I and IV respectively in the top half of Figure 3.5). In other market scenarios, the entrepreneurial response can be much more intensive. It may entail efforts to bring *new* instrumental-means from *outside*, or *external* to, the startup-venture's current environment to fulfill opportunities with root-origins in the existing or new markets (see the Quadrants II and III respectively in the bottom half of Figure 3.5).

(C). Level of entrepreneurship, degree of innovation, & 'regression opportunities'

Few authors have categorized opportunities as weak and strong forms of the Kirznerian (1997) and Schumpeterian (1934) types respectively in terms of the level of innovative effort required. The idea of producing hybrid cars for example is *more* innovative than a 7-Eleven store in a new location. Invariably, all market changes involve some 'level' of entrepreneurial *effort* to exploit the venture-opportunities that are triggered, as well as "some [level of] innovation" (Shane, 2012, p. 18). In other words, opportunities differ by the amount of innovation, with Schumpeterian (1934) opportunities generally requiring more innovation from the enterprising individual than the Kirznerian (1997) type of replicative arbitrageur (Levie & Autio, 2008, p. 239; Shane, 2012, p. 18). For instance, the idea of formulating a botanical drug requires more innovation than the idea of opening a McDonald's franchise in a new location.

Figure 3.6 provides an overview of the levels of entrepreneurial and innovative effort involved in different opportunity-types.

Figure 3.6 – Opportunity-types: Levels of entrepreneurship, innovation, & risk-uncertainty

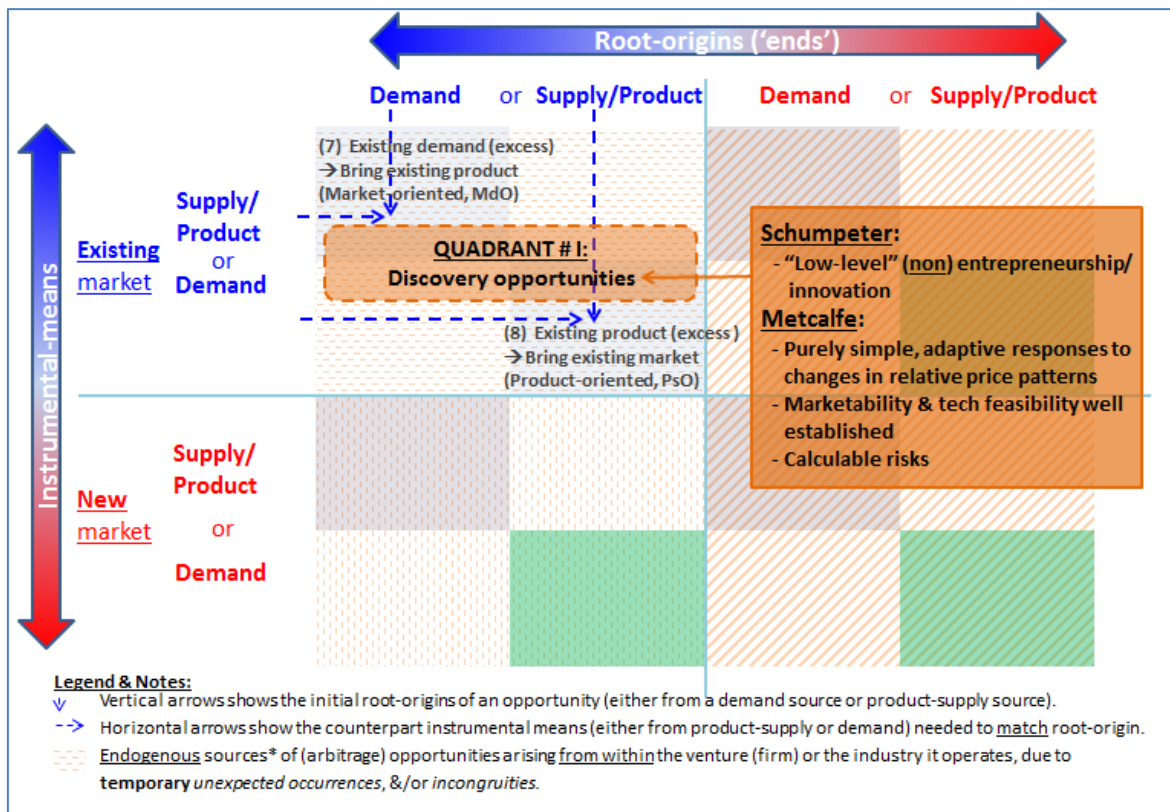


(1). Quadrant I – Discovery opportunity-types

The Kirznerian (1997) entrepreneurial process of discovery is relatively simpler where entrepreneurs merely notice the potential for profit within existing means-ends frameworks and do little else (Shane, 2012). The discovery process as Kirzner (1979) defines is simply “to *notice without search* opportunities that have hitherto been overlooked” (pp. 48, italics added for emphasis). These *discovery* opportunities (see Paragraph (A) of Section 2.6.3.2) reflect ongoing microeconomic market disequilibrium of “a less dramatic form . . . aris[ing] from the everyday mistakes market actors make in their investment, production, and distribution decisions and actions” (Gaglio & Katz, 2001, p. 100). These mistakes in existing markets create ‘incongruities’ (Drucker, 1985b), which manifest as “underpriced products, unused capacity, unmet needs, and so on” (Gaglio & Katz, 2001, p. 100). These pockets of disequilibrium reflected in relative price

patterns spawn opportunities for the discovery entrepreneur to arbitrage and/or imitate as a simple adaptive response. Quadrant I of Figure 3.6, reproduced below as Figure 3.7, is where *arbitrageable* discovery opportunities are found, representing the strictest form of objectivist opportunities.

Figure 3.7 – Level of entrepreneurship, innovation, and risk-uncertainty for discovery opportunities

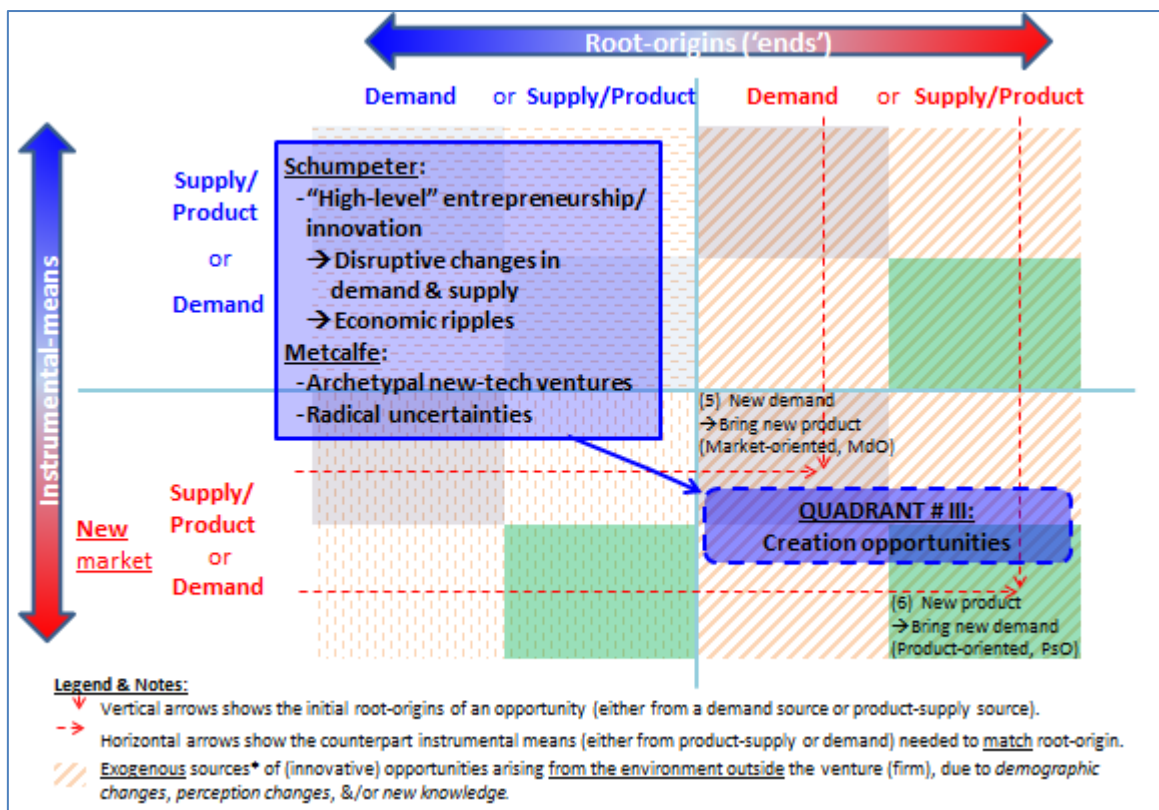


An entrepreneur who recognizes the co-presence of a homebuyer and homeseller in a residential neighborhood is an example of discovery opportunity. Marketability and technical feasibility is well established. Hence, Schumpeter (1934) associates discovery opportunities with 'low' levels of entrepreneurship. In fact, Shane (2012) stresses that effort to pursue discovery opportunities for arbitrage profit does not involve entrepreneurship, because little effort is required to recombine resources (Shane, 2012).

(2). Quadrant III – Creation opportunity-types

In contrast, Quadrant III of Figure 3.6, reproduced below as Figure 3.8, presents *creation* opportunity-types (see Paragraph (C) of Section 2.6.3.2), which require ‘high’ levels of entrepreneurial effort in terms of innovation. They can be triggered by root-origin sources relating to either *supply-side* or *demand-side* in *new/emerging* markets, which require equally *new* and innovative instrumental-means of demand or supply respectively to fulfill. It reflects “macroeconomic disequilibrium” (Gaglio & Katz, 2001, p. 99) with economic ripples brought about by disruptive changes so that both the root-origins and instrumental-means are not previously heard, known, foreseen, or predicted (Metcalf, 2009). Thus, a ‘high’ level of entrepreneurial effort is involved, such as by the archetypal new-technology venture, to make *new* instrumental-means (demand or supply) available for the *new* root-origins or ends of supply or demand (Gaglio & Katz, 2001).

Figure 3.8 – Level of entrepreneurship, innovation, and risk-uncertainty for creation opportunities

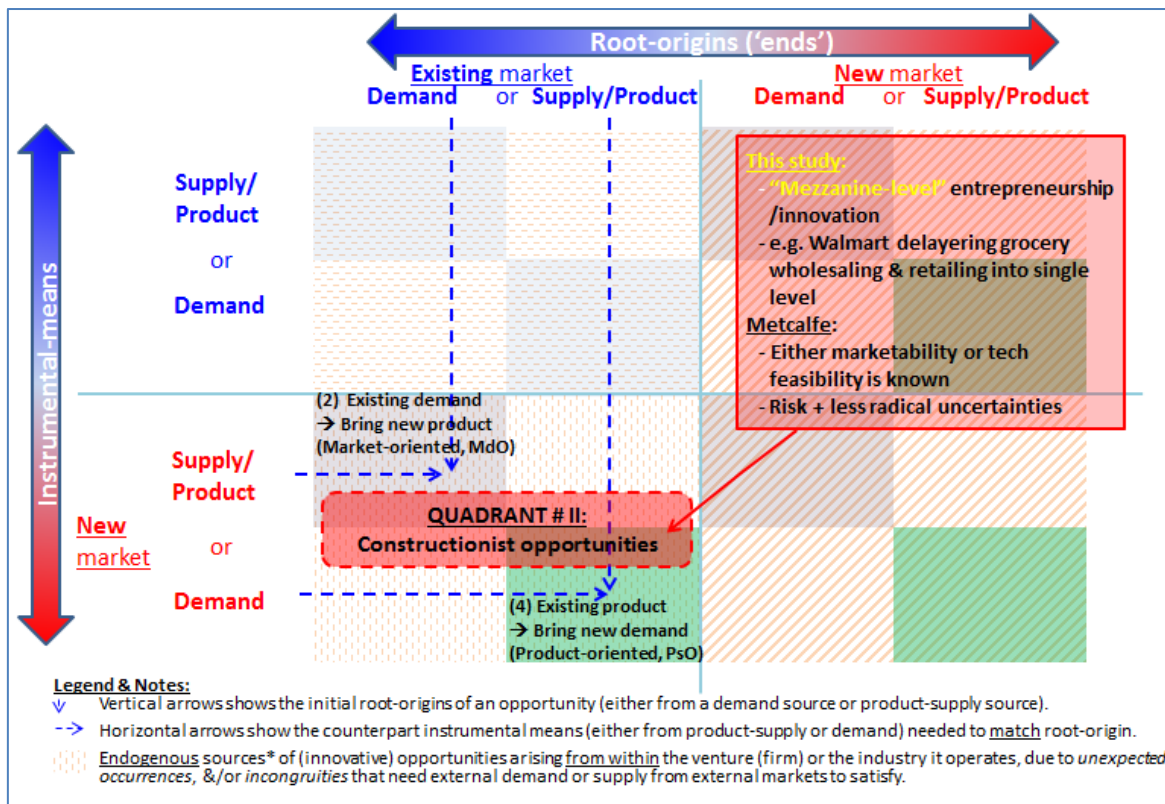


In his series of empirical studies, Von Hippel (1986) provides detailed examples of the types of innovative opportunities that stem from market/industry incongruities, process needs, and *new knowledge*. These sources of change on the supply-side are what Schumpeter (1934) calls *new combinations*, intended for demand that is new or yet to emerge. Alternatively, new customer demand may exist but is unobservable, unknown, and undetectable to the entrepreneur. The nature of demand for such kinds of market-opportunity has to be “imagined” (Dimov, 2003, p. 414) by the entrepreneur. Much more radical innovation (Drucker, 1985a) and intensive effort will be needed for the startup-venture level to tease out demand for its entrepreneurial venture-opportunity, which potentially is only a subset of the larger market-opportunity to be filled in the new market environment (tenet of dynamic duality’s malleability and multiplicity, and divisibility, see Sections 3.4.2.2 and 3.4.2.3 respectively).

(3). Quadrant II – Constructionist opportunity-types

In between the two extremes of arbitrageable *discovery* opportunities (low entrepreneurship) and highly *creative* opportunities (high entrepreneurship), there exist *constructionist* opportunity-types (see Paragraph (B) of Section 2.6.3.2) contained in Quadrant II of Figure 3.6, reproduced below as Figure 3.9. The root-origins of constructionist opportunity-types are triggered by supply-side or demand-side sources of change in *existing* markets, representing the objectivist “one side” (Sarasvathy, et al., 2010, p. 81) that is observable, known, and detectable. The entrepreneurs need to enact and bring instrumental-means from markets that are new and “unknown” (Sarasvathy, et al., 2010, pp. 82, Table 4.1 under “discovery opportunity”) to bridge and fulfill the constructionist opportunities. Relative to discovery and creation opportunities, a ‘mezzanine’ level of entrepreneurial effort is required to bring new and innovative instrumental-means to fulfill the ‘known’ root-origins in existing markets. An example would be Walmart Stores trying to serve its existing customers by delayering the wholesale and retail grocery business into a single hypermarket.

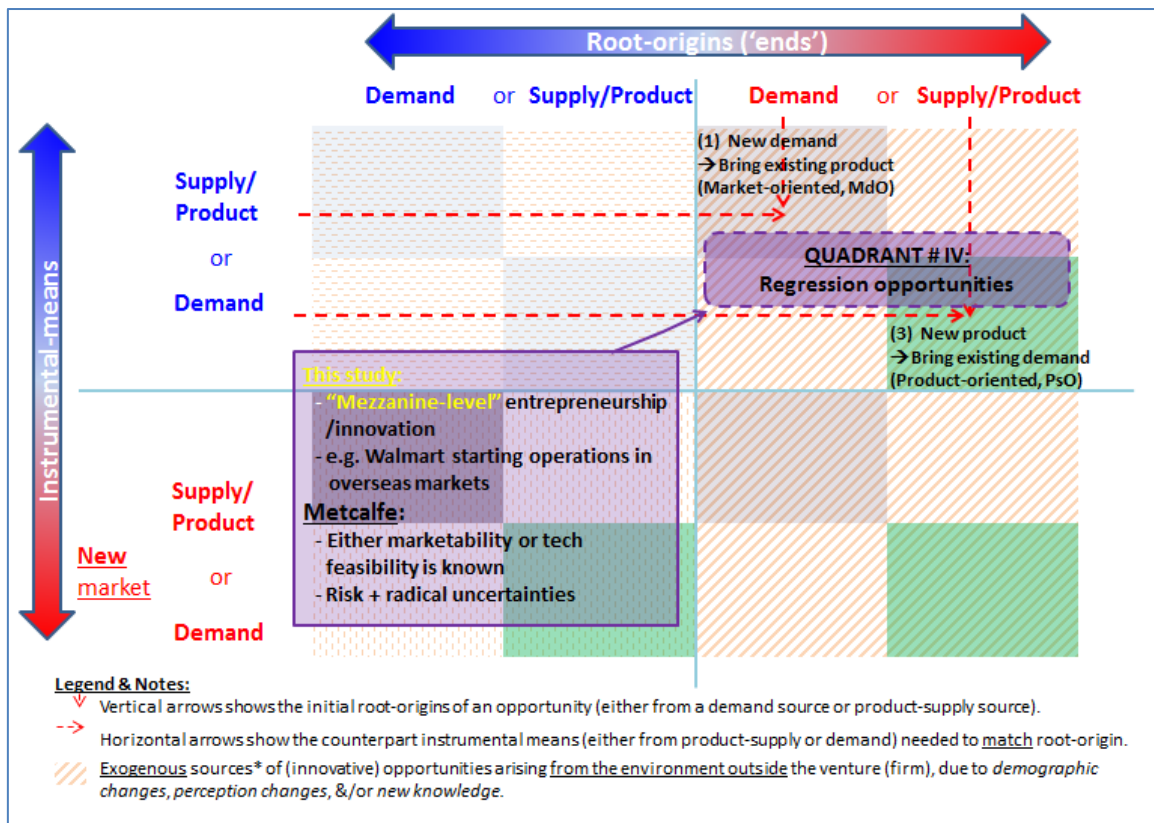
Figure 3.9 – Level of entrepreneurship, innovation, and risk-uncertainty for constructionist opportunities



(4). Quadrant IV – Regression opportunity-types

Following the same line of reasoning from above, the level of entrepreneurial and innovative effort required by the types of opportunity in Quadrant IV of Figure 3.6, reproduced below as Figure 3.10, are also ‘mezzanine’ in nature. The demand and supply related sources of change that trigger these opportunities originate in new/emerging markets and have to be satisfied by bringing instrumental-means, whether supply or demand respectively, from ‘known’ and observable existing markets. It is pertinent to note that the nature of opportunities in Quadrant IV of Figure 3.10 is the *inverse* of constructionist-opportunities in Quadrant II of Figure 3.9. For this reason, the opportunity-type in Quadrant IV of Figure 3.6 shall be termed ‘**regression opportunities**,’ which is further described in Paragraph (E) of Section 3.5.3.4.

Figure 3.10 – Level of entrepreneurship, innovation, and risk-uncertainty for regression opportunities



An example of regression opportunity would be Walmart starting operations in overseas markets like China as part of its geographic diversification strategy. To the extent that the nature of the new marketplace has yet to be scoped and understood, there is uncertainty even though the regression entrepreneur believes the need can be served by his/her existing product/service line.

(D). Risks and uncertainty

There has been little research done to assess the riskiness of opportunities (Shane, 2012, p. 16). Levie and Autio (2008) attribute this limited progress to “the difficulty of operationalizing the [opportunity] construct” (p. 240) in the manner outlined by Shane and Venkataraman (2000).

As evident from the discussions in the preceding sub-sections, the conceptual O-O-P framework with its yin-yang philosophical underpinning resolves the dilemma by operationalizing the

opportunity construct and categorizing it systematically into different ‘types’ based on their respective new (yin) and/or existing (yang) market-settings. Other than providing a visualization of various opportunity-types, the opportunity-hexadecadrant can also be used to assess and highlight their respective risk-uncertainty profiles.

(1). Quadrant I – Discovery opportunity-types

As discussed in Paragraph (A) of Section 2.6.3.2, the type of opportunities in Quadrant I of Figure 3.7 are arbitrageable discovery opportunities and solely risk-based. They relate to the existing markets where data can be collected to aid decisions in a risk-based context (Hmieleski & Baron, 2008). For these arbitrageable discovery opportunities, *both* their marketability and technical feasibility are known.

(2). Quadrant III – Creation opportunity-types

In contrast, creation entrepreneurs are unable to assess the probability of outcomes for their actions with respect to the creation opportunities in Quadrant III of Figure 3.8. There is no information to gather on creation opportunities because they arise in markets that are new, emerging, and unknown. Conditions in the emerging market are hazy; and absent information, the creation entrepreneur is *unable* to articulate meaningful technical feasibility studies and business plans to form and exploit creation opportunities. The creation entrepreneur must cope with radical *uncertainty*, ambiguity, and unpredictability in the new/emerging markets where they desire to operate (Hmieleski & Baron, 2008).

(3). Quadrants II and IV – Constructionist & Regression opportunity-types

The constructionist and regression opportunity-types in Quadrants II and IV of Figure 3.9 and Figure 3.10 are characterized by a *mix* of *risk*, relating to things already known in existing markets, and *uncertainty* in regard things not yet known in the new emerging markets (see Paragraph (B) of Section 2.6.3.2). The constructionist entrepreneur in Quadrant II of Figure 3.9 knows the risks associated with the root-origin of his/her constructionist opportunity in existing market, but is uncertain about the instrumental-means that he/she must bring as the new dualistic element. The development of a pharmaceutical drug that needs research and development to

remedy a known ailment is an example. Conversely, the regression entrepreneur in Quadrant IV of Figure 3.10 knows the risks associated with an existing instrumental-means that he/she thinks can be brought to meet an uncertain need that is yet to emerge in new markets. Whether the opportunity is of a constructionist or regression nature, *either* its marketability *or* technical feasibility is known but *not both*.

(E). Orientations of opportunities

In addition to clarifying:

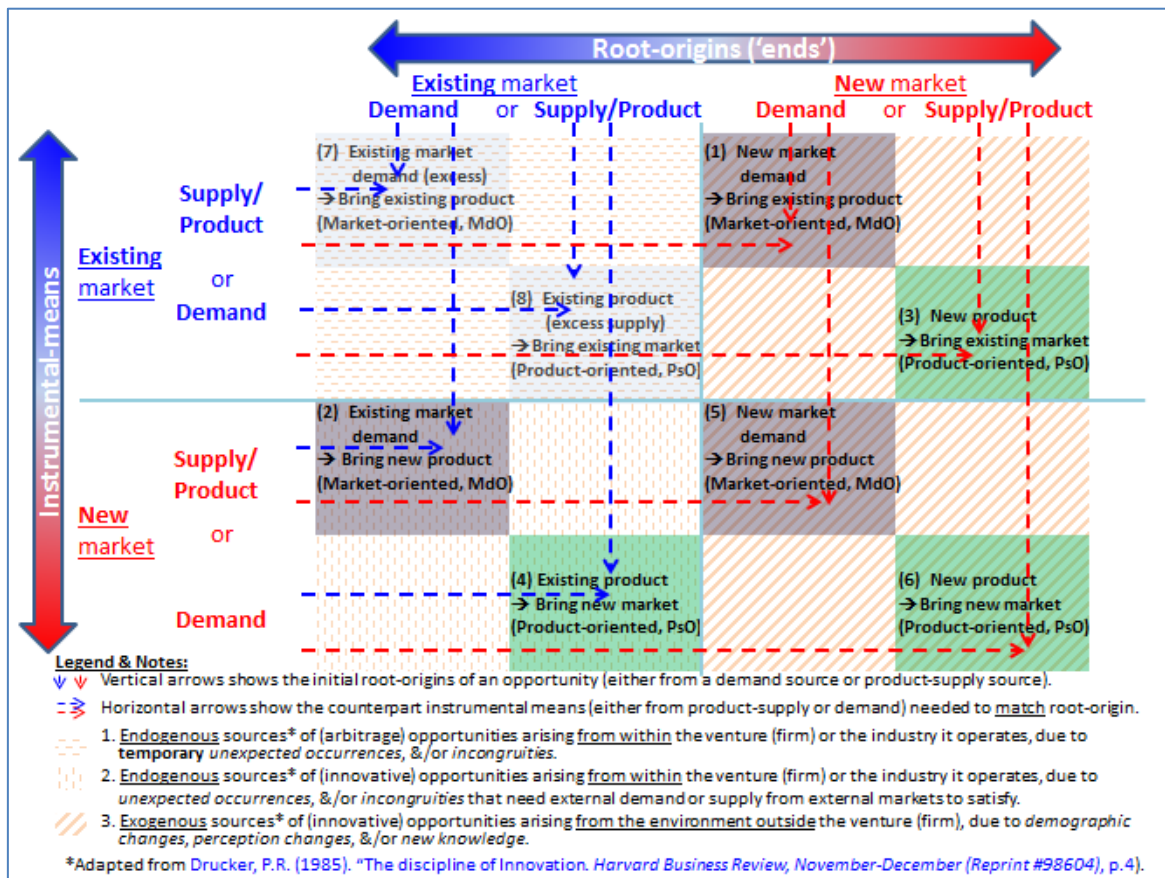
- (a) the dualistic nature of antecedents that result in different types of opportunities;
- (b) the environmental forces inherent in the opportunity construct;
- (c) the level of entrepreneurship and innovation; and
- (d) the risk-uncertainty profiles,

the conceptual O-O-P framework *operationalizes* the opportunity construct by providing insights on its orientation and therefore that of the entrepreneurial process also. Hence, this thesis heeds the call for research by Short, et al. (2010) to answer the question:

“Does an ‘opportunity orientation’ exist, and if so does it interact with market orientation?” (p. 59).

In Figure 3.11, the horizontal dotted arrows pointing from left to right signify the *orientation* of entrepreneurial process when bringing the instrumental-means (supply or demand) to match the root-origin (demand or supply respectively) of various opportunities.

Figure 3.11 – Opportunity orientations



As explained in the sub-sections below, the orientation of the respective market-opportunities *per se* (and their subsets as venture-opportunities undertaken at the level of startup-ventures) along with the related entrepreneurial process to bring the instrumental-means for the root-origin as a venture-outcome, can follow two trajectories depending on the root-origin.

(1). MdO (market/demand oriented) opportunities

The different opportunity-types can be MdO (market/demand-oriented), also referred variously in literature as demand-oriented, customer oriented, customer-focus, “customer led” (Narver, Slater, & MacLachlan, 2004, p. 335), “*responsive market orientation*” (Narver, et al., 2004, pp. 343, italics added for emphasis), or “*market-driven*” (Schindehutte, et al., 2008, pp. 6, italics added for emphasis). Examples of MdO are the opportunity-cells 7, 2, 5, and 1 in Figure 3.11. The associated functional activities are oriented towards ‘*bringing/pushing product to the*

market;’ or *finding a product-supply for the market* “in response to the . . . needs of its target customers” (Narver, et al., 2004, p. 343).

(2). *PsO (product-oriented) opportunities*

Opportunities can also be PsO (product-supply oriented), referred variously in literature as supply-oriented, “*proactive market orientation*” (Narver, et al., 2004, pp. 335, emphasis added), or “*market-driving*” (Schindehutte, et al., 2008, pp. 6, emphasis added). Examples are opportunity-cells 8, 4, 6, and 3 in Figure 3.11. The associated functional activities are oriented towards ‘*bringing/pulling market-demand to the product*’ or *finding a market for the product-supply* as an attempt to satisfy customers’ existing or latent needs “which a customer is unaware” (Narver, et al., 2004, p. 343). “Lead user groups” (Spencer, Kirchoff, & White, 2008, pp. 16 referencing Von Hippel, 1986) is an example of PsO activity.

(3). *Number of MdO and PsO opportunities*

In essence, the eight different opportunities categorized according to their ‘type’ (discovery, constructionist, creation, and regression) in Figure 3.11’s opportunity-hexadecadrant have unique **orientations**. Four are MdO (opportunity-cells 7, 2, 1, and 5), and four PsO (opportunity-cells 8, 4, 3, and 6). Each opportunity **reflects** the antecedent **root-origin** that triggered it (as indicated by the vertical dotted arrows pointing downwards). The antecedent root-origin is therefore the **defining orientator** and **unifying focus** for the entrepreneurial process of forming and exploiting the opportunity. As evident in Figure 3.11, each of the four different opportunity-types in the respective Quadrants have two opportunities that are MdO and PsO respectively.

3.5.2.4 Venture-outcomes & orientations

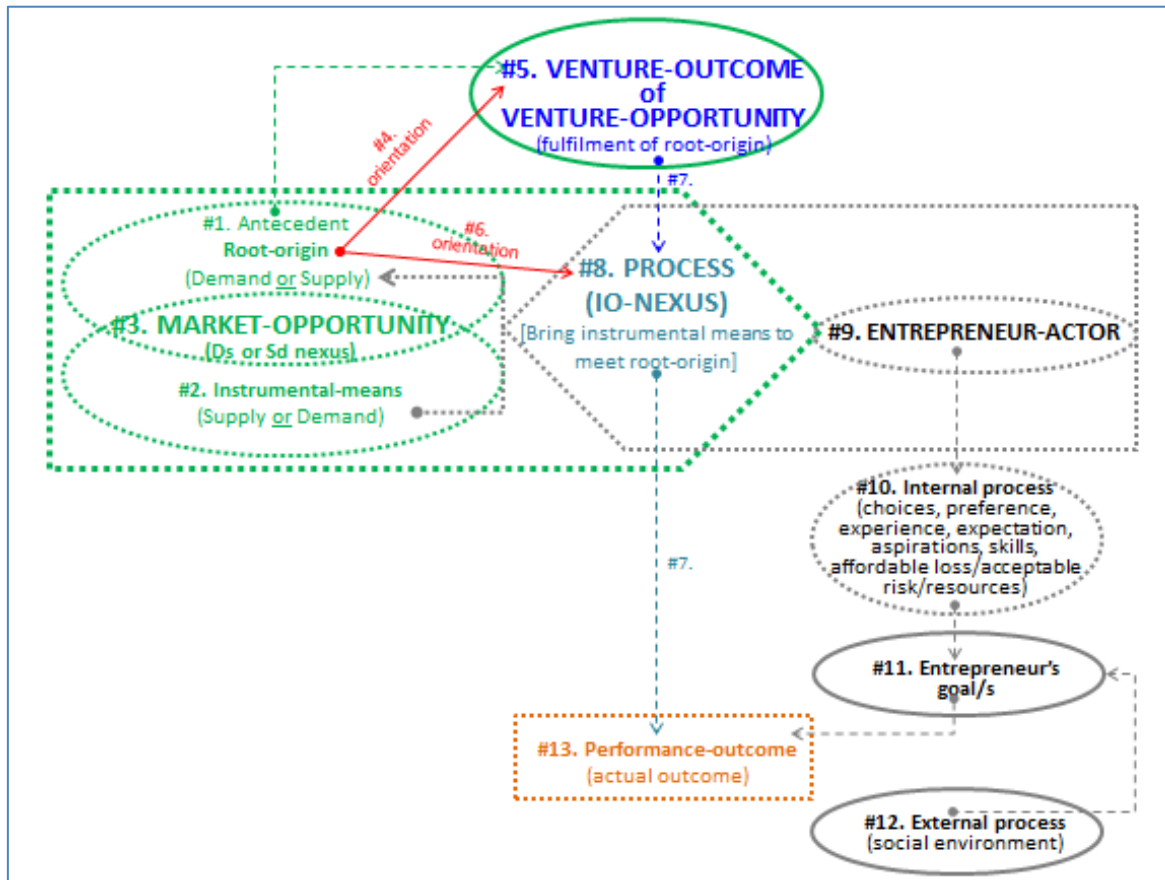
Following the deductive logic from the review of extant literature in Paragraph (C) of Section 2.6.3.1, Figure 3.11 shows the special role played by the root-origin of market-opportunity. The horizontal arrows pointing from left to right in Figure 3.11 show the instrumental-means (product-supply or demand) being directed/oriented to match the root-origin (demand or product supply) as the venture-outcome of the individual opportunity. **Thus, isomorphically, the root-**

origin is *ipso facto* the ‘end’ or ‘venture-outcome’ that the entrepreneurial process of bringing the instrumental-means is oriented towards achieving. The revelation brings several important research and practical implications for the conceptual O-O-P framework and IO-nexus notion as a single integrated entrepreneurship theory with the yin-yang concept providing the theoretical basis.

First, the nature of venture-outcome for a new venture pursuing its venture-opportunity as a subset of a particular market-opportunity can be articulated isomorphically as being ***the fulfillment of the opportunity’s root-origin***. This provides clarity and focus for the entrepreneurial process. In this connection, it is pertinent to point out that the extent of *a priori* venture-outcome for the particular entrepreneurial *venture*-opportunity at the new venture level is malleable and divisible. Just as the venture-opportunity is a subset of market-opportunity, its venture-outcome is also a subset of the larger outcome for the market-opportunity itself (tenet of dynamic duality).

Next, the venture-outcome is oriented by the market-opportunity’s root-origin (see # 4 in Figure 3.12). The fact that the orientation of venture-outcome can be objectively predetermined on an *a priori* basis from the root-origin, as either MdO or PsO, dispels criticisms that the IO-nexus notion does not adequately explain or even mention the outcome (Zahra & Dess, 2001). The venture-outcome is already embedded in the opportunity construct of the dualistic IO-nexus.

Figure 3.12 – Conceptual O-O-P framework



Third, the revelation that the venture-outcome is predeterminable objectively from the antecedent root-origin of market-opportunity *operationalizes* the ‘outcome’ construct for guiding the start-up entrepreneurial process of a new venture on an *a priori* basis. This is a key value proposition that the thesis’ conceptual O-O-P framework contributes to the body of extant knowledge. In particular, the framework sets the *venture-outcome* separate and apart from:

- (a) *entrepreneur’s goal/s* (see #11 of Figure 3.12), which is/are determined by subjective “internal processes” (Short, et al., 2010, p. 57) emanating from the individual entrepreneur’s actions, choices, and resource considerations (e.g., affordable loss) (see #10 of Figure 3.12), and
- (b) the *performance-outcome* or *actual outcome* (see #13 of Figure 3.12), which is a *post hoc* performance-related event that depends on the subjective influence of (i)

entrepreneur's goal/s and (ii) "external processes" (Short, et al., 2010, p. 57) emanating from the social environment (see #12 of Figure 3.12).

Thus, the venture-outcome's identity as the isomorphic antecedent root-origin of market-opportunity allows it to serve as an objective, *a priori*, predeterminable benchmark against which the *post hoc* performance/actual outcome of the entrepreneurial process can be compared, and the causes of *a posteriori* deviations ascertained and evaluated. In practice, the *extent* by which the new startup-venture achieves the *a priori* venture-outcome of its venture-opportunity (in terms of root-origin fulfilled) will be manifested *post hoc* as the performance/actual outcome, which can be influenced by a number of factors. They include external processes, such as government regulations, and internal processes of entrepreneur's goals. The latter are subject *inter alia* to the resources he/she has, including the 'three Sarasvathian means:' who he/she is, what he/she knows, and whom he/she knows (Sarasvathy, 2001). They determine the level of affordable loss and, in turn, the extent of venture-outcome he/she can and/or willing to 'effectuate.'

Having therefore objectively deduced/identified, functionally articulated, and duly operationalized the *venture-outcome* construct, the confusion in extant literature hitherto caused by the diversity of perspectives regarding the phenomenon of 'outcome' can now be unclogged. There is clarity now with regard the different *types* of outcome. They include (a) *venture-outcome* that relates to venture-opportunity, which can be objectively predetermined *ex-ante* to the entrepreneurial process, (b) *actual outcome* that relates to performance, ascertainable only *ex-post*, and (c) entrepreneur's goal/s, which is/are subjectively determined by the individual, and can influence the extent by which the venture-outcome is attained.

3.5.2.5 Antecedent-Ends-Means relationships

The knowledge that the market-opportunity's antecedent root-origin defines and orientates the venture-come helps lay the foundation to rationalize the causality relationship among venture-opportunity, venture-outcome, and the entrepreneurial process. Based on the foregoing discussion, the *order* of **causality** for start-up entrepreneurship can be logically

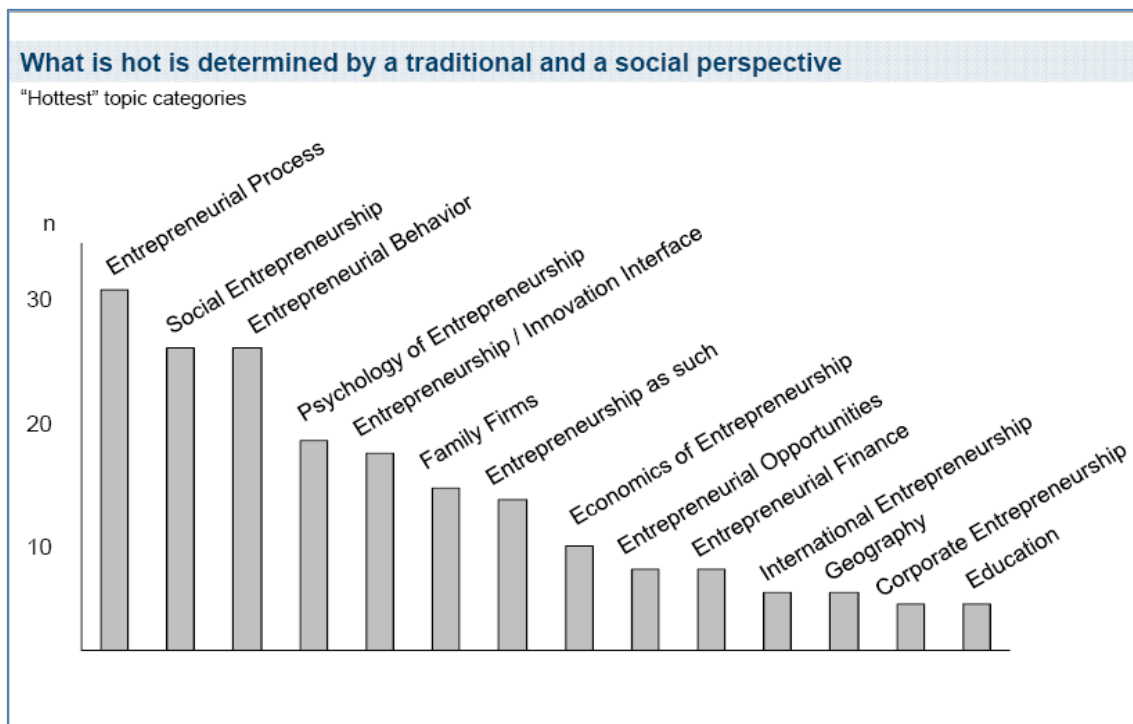
deduced/identified as venture-opportunity (root-origin) → venture-outcome (the *ipso facto* root-origin to be matched) → entrepreneurial process (**O-O-P**), in antecedent → ends → means (**A-E-M**) relationships. This knowledge in turn **operationalizes** the start-up *entrepreneurial process* for the conceptual O-O-P framework and IO-nexus as a single integrated entrepreneurship theory. The next few sub-sections explain the entrepreneurial process in the start-up phase of a new venture as contextualized by the conceptual O-O-P framework.

3.5.3 Entrepreneurial process

Entrepreneurial functional process is emerging as one of the “hottest” topic of research from a traditional and social perspective (see Figure 3.13). Dimov (2011) however reminds that the explanations regarding entrepreneurial process need to describe the generative sequence of events and be mindful of the holistic configuration of contributing circumstances and actions (p. 70).

Figure 3.13 – “Hottest” entrepreneurship topic

Source: Kuckertz (2013)



3.5.3.1 Definition of entrepreneurial process

Following the logic of deductions made from literature review in Paragraph (C) of Section 2.6.3.1, and the discussion on the nature of venture-outcome in Section 3.5.2.4, ‘entrepreneurial process’ in the conceptual O-O-P framework can be defined as follows:

Entrepreneurial process is the fulfilling act of forming and exploiting venture-opportunity by bringing together the instrumental-means (either demand or supply) and the root-origin (either supply or demand).

This definition of entrepreneurial process²¹ is consistent in spirit with “match-up between supply and demand” mentioned by Venkataraman and Sarasvathy (2001, p. 8), albeit innovation can be involved (Drucker, 1985a).

3.5.3.2 Orientations of entrepreneurial process

As mentioned in Paragraph (E) of Section 3.5.2.3, the horizontal arrows pointing from left to right in Figure 3.11 signify the *orientation* of entrepreneurial process for venture-opportunities as subsets of the different market-opportunities (indicated as opportunity-cells), by matching the instrumental-means (product-supply or demand) to the root-origin (demand or product supply) as a venture-outcome.

Paragraph (E) of Section 3.5.2.3 also highlights the root-origin as the defining orientator of the entrepreneurial process for the venture-opportunity. Depending on whether the root-origin is demand or supply, the orientations of the entrepreneurial process for the respective opportunities is either MdO or PsO respectively.

²¹ In principle, entrepreneurial process can include ‘functional’ processes and economic activities that are associated with, or related to (a) marketing (i.e. ‘*marketing-related*’ activities such as market research, market information collection, pricing, promotion/advertising, place/distribution, and customer service), (b) production (i.e. *production-related* activities like product design, development, packaging, and promotion),

(A). *MdO (market-demand oriented) entrepreneurial process*

Deshpandé and Farley (1998) define market-orientation as “the set of cross-functional processes and activities directed at creating and satisfying customers through continuous needs assessment” (pp. 213, italics and underscore added for emphasis). They posit that the concept of market-orientation is central to management studies based on the *marketing* concept (Deshpandé & Farley, 2004, p. 5). MdO functional activity is *externally focused* or “outward looking” (Stimpson & Farquharson, 2010, p. 246). This means that the “organization wide” (Kohli & Jaworski, 1990, p. 6) *functional marketing-related* and production-*related activities* are oriented around the business *outcomes* of anticipating and satisfying the wants, preferences, needs, and requirements of the market *customers* (Stimpson & Farquharson, 2010). Customer-focus and market orientation give direction and value to functional processes (Pulendran, Speed, & Widing II, 2003). Providing prospective customers with free samples or free trials is an example of MdO activity to ascertain their needs. The *outcome* is to bring/push to market the product/service that “consumers want, rather than try to sell them a product or service they may not really want to buy” (Stimpson & Farquharson, 2010, p. 246). The focus will be to generate market intelligence (Taghian, 2010) and analyze customer needs and preferences (Kohli & Jaworski, 1990). The MdO outcome is *not* just to make a product that is technically superior in its attributes and features *per se*, but to make it as a reaction to what customers want and need rather than what is right for the customer.

Narver and Slater (1990) operationalize market-orientation along three dimensions, viz. customer orientation, competitor orientation, and inter-functional coordination:

- (a) Customer orientation. Narver and Slater (1990) define customer orientation as “the sufficient understanding of one’s target buyers to be able to create superior value for them continuously” (p. 21), or “the ability and the will to identify, analyze, understand, and answer user needs” (Gatignon & Xuereb, 1997, p. 78). To do so, there is need for continuous market research and market analysis to determine the *market feasibility* of products with regards present and future consumer demand, needs, desires, beliefs, attitudes, and expectations, which “continually evolve over

time” (Jaworski & Kohli, 1993, p. 53). Ongoing tracking of, and constant feedbacks from, customers will allow adaptation of the product *to the changing consumer needs and tastes* in the marketplace “before competitors get there first” (Stimpson & Farquharson, 2010, p. 247).

- (b) Competitor orientation. Narver and Slater (1990) define competitor orientation to mean:

“... understand[ing] the short-term strengths and weaknesses and long-term capabilities and strategies of both the key current and the key potential competitors represents.” (p. 21)

In volatile and fast-changing consumer markets (such as mobile phones), growing consumer awareness of competitors’ products, prices, promotion, and brand image can adversely impact the demand for a venture’s products and services (Stimpson & Farquharson, 2010, p. 246). Market-orientation with focus on competitors will prompt quick and decisive response by a *startup-venture* to competitors’ actions, and segment the market in its formative stage (Shane, 2001) to drive product into the market (Jaworski & Kohli, 1993). There is risk however that “competitor-orientation can increase the introduction of me-too products and reduces the launching of [product] line extensions and new-to-the-world products” (Lukas & Ferrell, 2000, p. 239) by a startup-venture.

- (c) Interfunctional coordination. Narver and Slater (1990) define interfunctional coordination as:

“the coordinated utilization of company resources in creating superior value for target customers” (p. 21)

The coordination of various functional activities (described in Section 3.5.3.3 below) will revolve around achieving the central MdO outcome, which is to meet customers’ needs (Stimpson & Farquharson, 2010, p. 246). Inter-functional coordination of market-*related* and product-*related* activities oriented towards the

market “increases the launching of [product] line extensions and reduces the introduction of me-too products” (Lukas & Ferrell, 2000, p. 239).

Simply put therefore, MdO entrepreneurial process entails matching the organization’s internal productive resources (capabilities) with the existing and new/emerging conditions in the environment (McDonald, 2007). In the context of the O-O-P framework, the entrepreneurial process that corresponds to an MdO opportunity of a startup-venture will be oriented towards bringing the instrumental-means (product-supply or demand) in response to the root-origin (demand or product-supply respectively) as the *a priori* venture-outcome. In practice, an MdO startup-venture will *first* focus on what the market customer wants to “give direction and value” (Taghian, 2010, p. 5) to the entrepreneurial process of ***bringing/pulling product/service to its market demand*** (Pulendran, et al., 2003).

(B). PsO (product-supply oriented) entrepreneurial process

Whereas market-orientation gets the right product, product-orientation gets the product right²². Product-orientation focuses on the “product and on the skills, knowledge and systems that support the product . . . [so as to] get the product right.”²³ According to Doyle (2011), product-orientation is “a management philosophy, concept, focus, or state of mind, which emphasizes the quality of the product rather than the needs and wants of the target market.” He adds that product-orientation assumes customers will favor products that are better in quality, performance, and features. Concentrating on them will achieve the venture's objectives more easily. Thus a PsO startup-venture will develop what it thinks is good (Dawes, 1998) in terms of *technical superiority* and/or *technical feasibility* of product and operations respectively. This is generally true of companies operating in the high-technology sector, where product-orientation is invariably associated with technology-orientation, which is defined as “a firm’s ‘ability and will to acquire a substantial technological background’ and knowledge base” (Gatignon & Xuereb, 1997, p. 78).

²² <http://businesscasestudies.co.uk/business-theory/operations/market-and-product-orientation.html>

²³ Ditto.

A company's technological base facilitates the development of more innovative, breakthrough products (Gatignon & Xuereb, 1997; Spanjol, et al., 2012, p. 970; Zhou, Yim, & Tse, 2005). Both the functional product-*related* activities and the market-*related* activities undertaken as part of the exploitative opportunity-adventuring process to achieve the *outcome* of bringing the market to the product will have a product-*orientation*. In other words, the *PsO outcome* for a startup-venture will be to “stimulate demand for products it produces, rather than producing products in response to customer needs” (Saxe & Weitz, 1982, p. 344).

In contrast to MdO outcome therefore, the *PsO outcome* will be *internally focused* (Dawes, 1998) or *inward looking* (Stimpson & Farquharson, 2010, p. 247). Its focus is to gather and apply technical information, make the product or service, and *then* try to sell it to the market (Stimpson & Farquharson, 2010) as the *outcome*.

For instance, a new technology may constitute a new means of supply, but the startup-venture would need to *find* the market to apply that technology (Venkataraman & Sarasvathy, 2001). As Venkataraman and Sarasvathy (2001) emphasize, “The mere existence of the internet did not guarantee the development of e-commerce” (p. 7). Likewise as Schumpeter (1939) quips,

“It was not enough to produce satisfactory soap, it was also necessary to induce people to wash.” (p. 243)

Thus for *PsO* opportunity, there is still the need to bring market demand to the product-supply, or as Venkataraman and Sarasvathy (2001) say, “[T]he match-up between supply and demand has to be implemented” (p. 8) as an entrepreneurial process for the opportunity to happen.

A startup-venture with a technology solution must find consumers to buy it *as a PsO outcome*. In this sense, the basic product-related functional activity is to produce, and the marketing-related functional activity of selling the product/service is incidental, says Dawes (1998) quoting Keith (1960).

Startup-ventures with product-orientation will generally concentrate on establishing selling points for their products, emphasizing operational elements like innovation, quality, and efficiency and cost-effectiveness (i.e. cost-down) in their focus:

- (a) Innovation. In the case of a new venture oriented towards *innovative products* (e.g. WAP mobile phones), its prospective consumers may not know that such products are available until the basic concept has been invented, developed and productized (Stimpson & Farquharson, 2010). Examples of such ventures are the pharmaceuticals and electronics companies, which focus on pure research.
- (b) Quality. Startup-ventures driven by product-*quality* believe that quality takes priority over market fashion and preferences, and consumers will buy if the product is safe and has good quality. This is true of food and beverage companies (Stimpson & Farquharson, 2010).
- (c) Efficiency and cost-effectiveness. New ventures emphasizing product-oriented outcomes may also look at the *efficiency* and *cost-effectiveness* of their products when forming and pursuing their opportunity-subtypes. Inasmuch as the strategic focus is product-oriented, such ventures can also be ‘production-oriented’ (Dawes, 1998)²⁴. Here research that involves collecting inter-functional input from workers, engineers, finance, and accounting becomes important as the startup-venture attempts to ‘cost-down’ its production process. In practice, production-oriented ventures are *usually* very large firms that manufacture products or offer services in very large quantities. Invariably, they are found in the growth or later stages of business lifecycle. In contrast, a startup-venture (which is the *unit of analysis* of this study) is typically small in terms of business scale and capital resources. Production-oriented outcomes are therefore irrelevant for the purpose of this study and hence excluded from consideration herein.

In the context of the O-O-P framework, the entrepreneurial process that corresponds to a PsO opportunity of a startup-venture will be oriented towards bringing the instrumental-means (demand) in response to the root-origin (product-supply) as the *a priori* venture-outcome. In

²⁴ According to Dawes (1998), “production orientation appears synonymous with a high emphasis on achieving efficiency in operations” (p. 573).

practice, a PsO startup-venture will *first* fashion and develop the *product* or *service*, in the belief that it can *bring/pull* the *market demand to its product/service*.

3.5.3.3 Functional activities of entrepreneurial process

The entrepreneurial process for a new venture is multi-dimensional and involves a variety of *functional* activities to fulfill and achieve venture-outcomes. To operationalize the entrepreneurial process of the conceptual O-O-P framework, there is need for clarity on two issues. First, there is the need to understand *what* the types of functional activities are. Second, there is the need to know *how* the functional activities are conducted in terms of *orientations*.

(A). Specific types of functional activities

In practice, the functional activities of entrepreneurial process are intertwined, contiguous and overlapping (Low & MacMillan, 1988). They include without limitation all the economic activities associated with marketing, production/ development, information search, and learning, building the organization, acquiring and allocating resources²⁵, and so on. As Low and MacMillan (1988) advise:

“[S]tudies that merely document the stages of a startup are of questionable value. However, identifying the major tasks that need to be accomplished during the launch of a venture has practical value.” (p. 153)

The primary functional activities that are critical to a new venture at the start-up stage can ordinarily be grouped into two broad categories. The first is marketing-*related* activities, such as market research, market information collection, pricing, promotion/advertising, place/distribution, and customer service). The second is product- or production-*related* activities, like product design, development, packaging, and promotion.

²⁵ ‘Resources’ are deemed in literature to include “equipment, space, and money . . . also advice, information, and reassurance” (Birley, 1985, p. 107), as well as information, experiences, a range of skills and views, and technical and management knowledge (Foo, Wong, & Ong, 2005).

There are many other *general* functional activities (such as financing, building structure/organization, acquiring and allocating resources, and so on). They are sufficient but not necessary *a priori* as activities to achieve the venture-outcomes for new ventures at the start-up phase (Stevenson, 2006). These non-marketing and non-production related activities generally facilitate the primary functional activities that are marketing-related and production-related. General functional activities come *after* the primary activities have been determined and decided upon for implementation. Their importance is unlike the primary marketing-related and product-related activities for several reasons.

First, general activities such as financing, which involve the acquisition and allocation of money resources, do not (and should not) affect the *orientation* of venture-outcome *per se* (whether market- or product- oriented). They are generally not prominent in the start-up stage of new ventures, which typically have little or “[no] regard to resources they currently control” (Stevenson, 2006, p. 3; Stevenson & Jarillo, 1990, p. 23). The reason is that a new venture has very limited resources to ‘start’ with anyways (Stevenson, 2006). Bootstrapping is often practiced. If at all, financing activities are secondary variables that can be used to explain, on a *posteriori* basis, the *post hoc* deviations/distortions in performance-outcome from the *a priori* venture-outcome described by the conceptual O-O-P framework. For instance, the lack of money resources may affect the scope and priority of activities when bringing instrumental-means to pursue the opportunity. It may affect the propensity of affordable loss (Sarasvathy, 2001), thereby affecting the speed and *extent* by which the *a priori* venture-outcome is attained. The ‘result’ will be reflected *post hoc* in the performance/actual outcome.

Second, the general activities relating to the acquisition and allocation of *other* resources (e.g., information and learning) are a sub-part of the marketing-related and production-related functional activities. They can therefore be subsumed thereunder for discussion purposes.

Third, building structure/organization as a general activity is irrelevant to a new startup-venture. For new ventures at the start-up stage, rigid organizational structures are “anathema . . . [and] flat organizations, informal relationships and networks, and frequent changes are the norm” (Stevenson, 2006, p. vii). Venture-opportunity is the ‘subject’ of *how* entrepreneurs conduct the

start-up *process* “whether through specific company structures or not” (Stevenson & Jarillo, 1990, p. 25).

Regarding the primary marketing and product related functional activities that are critical to a startup-venture, there is a general awareness that they each represent an *amalgam of individual functional dimensions*, which complicate the assessment of whether the marketing-related and product-related functional processes are market-oriented or product-oriented. A practical and objective way to resolve the complexity and operationalize the dimensions for research and practice is to distill some of the *key* individual functional dimensions from the checklist of due diligence criteria used by venture capitalists to evaluate the ‘investibility’ of new startup-ventures. Such deputation is similar to the approach used by scholars for “strategic adaptation research” (Low & MacMillan, 1988, p. 143)²⁶ on the practices in the venture capital community. Their works assume that venture capital firms, which routinely profit from assessing new venture proposals, would have developed the necessary skills to identify successful ventures to invest in (Low & MacMillan, 1988). Such skills are translated into a set of pre-funding evaluation criteria, more commonly called ‘due diligence checklist,’ used to assess and fund venture proposals.

Table 3.2 below distills the venture capitalists’ due diligence factors that relate *specifically* to product- and market- related activities into the *two center columns*. It should be noted that these individual functional dimensions might not be exhaustive in reflecting all the opportunity-exploitation activities that a startup-venture does; neither are they suggestive of what a startup-venture must do. Nevertheless, they *represent* and help to *indicate* some of *the more important* individual functional dimensions that venture capitalists would look for in venture deals, even though their emphasis and focus may differ on a case-by-case basis depending on the circumstances under which the startup-ventures operate (e.g. the type of industry, nature of products, capital-to-labor ratio, and so on).

²⁶ Strategic adaptation researchers like Vesper (1990) typically look at key success enhancers of venture survival. They include customer orders, personal contacts, physical resources, product/service idea, technical knowhow, entry strategies (new product/service, imitative product/service, franchising, and so on).

To operationalize the marketing-related and product-related activities for the startup-venturing process in the O-O-P framework, and guide empirical research, Table 3.2 clusters and categorizes the distilled individual functional activities in the two center columns into four groupings of general dimensions as shown in the two outer columns.

Table 3.2 – 'Operationalized' product- or marketing- related activities

Source: Summarized and adapted from various readings, including Sukriwong (2003); and other 'classics' including Hall and Hofer (1993); Knight (1994); MacMillan, Siegel and SubbaNarasimha (1985); Manigart and Wright (1997); Tyebjee and Bruno (1984).

<u>General</u> product-related opportunity exploitation dimensions	Checklist of factors used in due diligence by venture capitalists		<u>General</u> marketing-related opportunity exploitation dimensions
	<u>Specific product-related</u> opportunity exploitation dimensions	<u>Specific marketing-related</u> opportunity exploitation dimensions	
Product/technical feasibility analysis	<ul style="list-style-type: none"> - Product attributes - Proprietary product - Superiority of product performance 	<ul style="list-style-type: none"> - General business conditions - Market size - Market growth potential - Market acceptance of product - Export potential 	Market feasibility analysis
Business planning & inter-functional coordination	<ul style="list-style-type: none"> - Economically justifiable - Sound business plan 	<ul style="list-style-type: none"> - Economically justifiable - Sound business plan 	Business planning & interfunctional coordination
Product development strategy	<ul style="list-style-type: none"> - Prototype - Degree of equipment facilities - Properness of facility layout - Technology development capability 	<ul style="list-style-type: none"> - Degree of client procurement - Degree of sales distribution channel - Known distribution system - Market development and sales 	Sales development strategy
Competitive analysis & product differentiation strategy	<ul style="list-style-type: none"> - Degree of technical manpower - Degree of core technology - Technology - Product differentiation - Stable supply of raw materials - Degree of product margin - Easiness of labor procurement - Sound business plan 	<ul style="list-style-type: none"> - Competitive threat - Competitive advantage - Barriers to entry - Product differentiation - Potential to create new market - Price competitiveness of product - Price stability of raw materials - Sound business plan 	Competitive analysis & market differentiation strategy

Categorizing the list of specific marketing-related and product-related activities distilled from the venture capital due diligence checklist according to *general* dimensions offers a number of advantages:

- (a) It provides a general but operational list of *specific* functional marketing-related and product-related activities that are integral to the opportunity-exploitation process. This allays some of the concerns of Barksdale and Darden (1971) regarding for instance the concept of marketing as lacking clarity and being merely a “philosophical idea and idealistic policy statement, for management . . . to implement . . . and . . . operational[ize] on a day-to-day basis” (p. 36).
- (b) It is difficult in practice to discern the marketing-related and product-related functional activities of the entrepreneurial process because they are *amalgams* and often “intertwined, contiguous and overlapping” (Low & MacMillan, 1988, p. 141). Using general dimensions for categorization retains some degree of specificity, allowing researchers to distinguish various *primary* marketing-related and product-related functional activities that are incidental to the entrepreneurial process of bringing the instrumental-means to meet the root-origin and achieve the *a priori* venture-outcome. At the same time, it becomes easier for marketing and management scholars to empirically verify the *orientations* and *analytical generalizability* of these activities (whether MdO or PsO) “as one of *degree*, on a continuum” (Kohli & Jaworski, 1990, p. 6). Absent categorization, the individual activities may be perceived by researchers as “dichotomous either-or constructs” (Kohli & Jaworski, 1990, p. 6) rather than complementary and continuous notions unified by the strategic need to achieve the *a priori* venture-outcome that relates to the particular opportunity undertaken.

(B). Orientations of functional activities

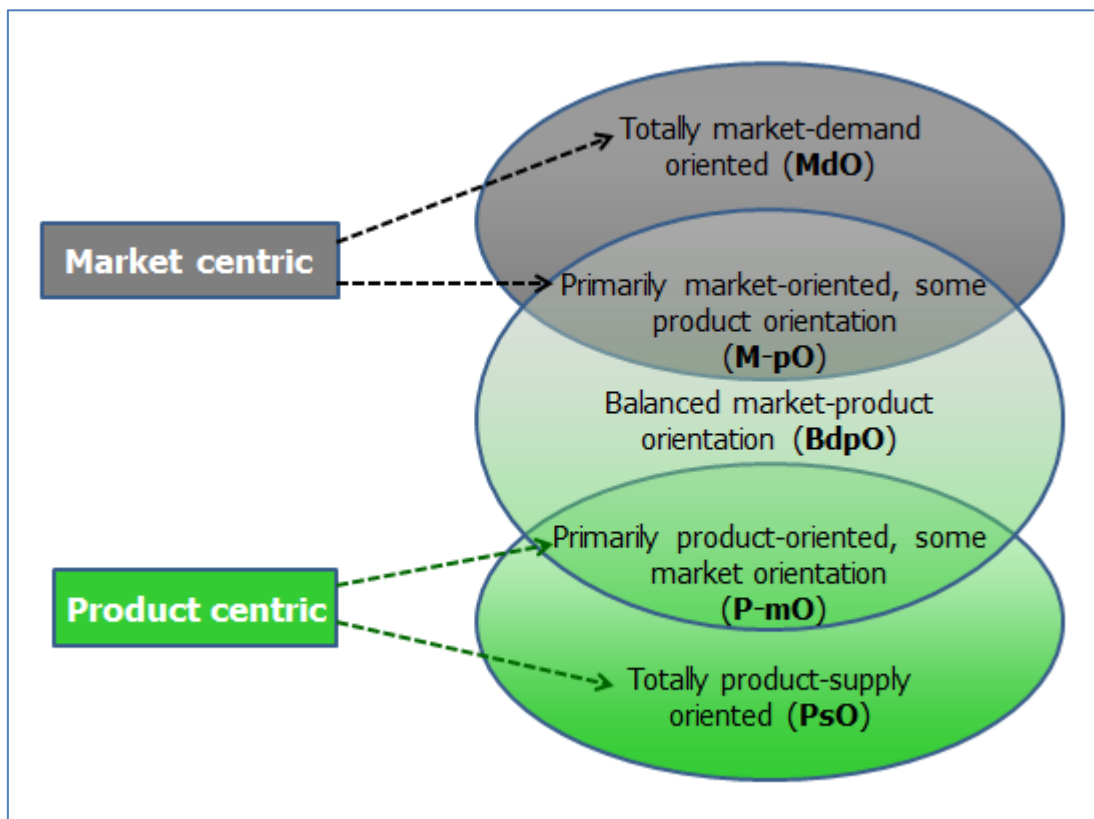
As revealed in Paragraph (E) of Section 3.5.2.3, marketing-related and product-related functional activities can *a priori* be *directly* oriented and *shaped* by orientations of the venture-outcome to be achieved, which is isomorphically the root-origin of an opportunity. A venture-outcome that is MdO will orientate the marketing-related and product-related activities that bring product to the market. The same holds true for a PsO venture-outcome, which will orientate and shape the marketing-related and production-related functional activities to bring market-demand to the

product. In essence, therefore, marketing-related and product-related activities of the start-up entrepreneurial process have the capacity and pliability to assume orientations that are *antecedently* determined by the root-origin of the respective types of opportunity to which they relate.

(C). *Continuum of orientations*

Potentially, the *orientations* of the functional activities as categorized according to the general dimensions may exist over a continuum, from MdO on one polar extreme to PsO on the other (see Figure 3.14). Functional activities with *mixed* orientations in various proportions can also exist in the middle of the continuum. They can have a ‘balanced’ demand-product orientation (**BdpO**), or an orientation that is more demand than product inclined (**M-pO**), or more disposed towards product than demand (**P-mO**).

Figure 3.14 – Continuum of orientations



(D). Operationalizing orientations of start-up entrepreneurial process

Even though the individual primary functional activities are categorizable according to the general dimensions, there remain difficulties in determining their orientations in practice. A solution is to start by examining the orientation of individual marketing-related and product-related activities in terms of their ‘focus,’ whether market needs or product features. The examination can then be followed by ascertaining the general category to which the specific activity belong, and therefore the market-orientation *or* product-orientation of the host category “as one of *degree* on a continuum” (Kohli & Jaworski, 1990, p. 6) – i.e., being *more* market-oriented or *more* product-oriented. This approach of gauging orientation by ‘looking at’ specific individual dimension and ‘looking through to’ the general category will streamline assessment and avoid confusion in determination.

For instance, a product-related activity such as drug research may be purely product-oriented or focused at the initial stage of a startup-venture. The filing of patent to protect intellectual property is product-related, but it confers strategic advantages when marketing the product in a competitive environment. Hence, although there is a ‘shade’ of product-orientation, the patent is filed for marketing-related purposes. On the continuum of orientation possibilities, the patenting activity of the startup-venture can be considered MdO.

Thus, the extent/degree of market- and/or product- orientation of the start-up entrepreneurial process *in general* can be operationalized by looking at and looking through to the orientations of specific *functional* marketing-related and/or product-related activities as provided by the venture capital due diligence checklist compiled in Table 3.2. This approach of systematic determination facilitates objective field assessment and empirical verification of the orientation of entrepreneurial process for different opportunities as conceptualized by the O-O-P framework.

3.5.3.4 Teleological approaches to forming and exploiting entrepreneurial opportunities

This thesis submits that even when extant approaches (teleological or otherwise) are recontextualized in the yin-yang philosophical universe, they can retain their relevance when

explaining the *entrepreneurial process* of balancing, rebalancing, and transforming the demand and supply elements within the different opportunity-nexuses. In fact, the reframing makes them teleologically coherent and robust when explaining the respective opportunity-types without being paradoxical (see [Section 2.6.3.2](#)),

As systematically described in Chapter 2's literature review, the teleology of each of the three approaches (discovery/positivist-realist, constructionist, and evolutionary-realist) is based on a particular set of mutually exclusive theoretical view (either objectivist or subjectivist) regarding market-opportunities. Their respective received views however cannot represent adequately or accurately the ontological phenomenon of market-opportunities in the universe. On a standalone basis, each of the approaches is insufficient to address the entrepreneurial process phenomenon, which Shane and Venkataraman (2000) have elegantly articulated as a nexus between opportunity and the enterprising individual. More importantly, their received theoretical positions create problems for entrepreneurship research. The problems include paradoxes when explaining opportunity's ontological nature and its epistemological formation process. They also handicap the ability of the IO-nexus as a notion in explaining the entrepreneurial process (see [Section 2.6.3.2](#) for details, and [Paragraph \(D\)\(1\) of Section 2.6.3.2](#) and [Section 3.1](#) for summary and overview respectively).

To solve the dilemma, the conceptual O-O-P framework submits the yin-yang duality philosophy as it is generalizable to explain various phenomena in the natural world, including opportunity and the entrepreneurial process. It is compatible with contrasting ontological positions, because it accommodates the different market-settings (see [Section 3.2](#)).

The 'both/and' spirit of the yin-yang concept provides the philosophical basis to reframe the teleological approaches (see [Sections 3.3](#) and [3.4](#)) and resolve the paradoxes in their explanations hitherto inadvertently imposed by their received subjectivist and objectivist perspectives (see [Sections 3.4.3](#) and [3.4.4](#)), which are *yin* and *yang* views respectively in fragmented states. In the yin-yang environment, the extant teleological approaches can then be integrated seamlessly and holistically within the conceptual O-O-P framework, turning it into a single integrated parsimonious theory of start-up entrepreneurship that operationalizes the notion of IO-nexus. Also in the yin-yang universe of the conceptual O-O-P framework, the epistemological process

of forming and exploiting a market-opportunity will depend on its ontological yin-yang nature. As explained in Sections 3.5.2.1 and 3.5.2.2, a market-opportunity has an objective existence, but its *observability*, *knowability*, or *detectability* is dependent on that of its dualistic demand and supply constructs. For instance, where an opportunity is unobservable (*yin*), whether in whole or in part (in terms of its antecedent demand and supply factors), the epistemological *process* of forming and exploiting the venture-opportunity as *subset* of a particular market-opportunity can be *subjective* and *creative* (*yin*), without *rejecting* the *objective* (*yang*) existence of market-opportunity. This yin-yang logic rationalizes the philosophy behind Shane's (2012) comment below, perhaps unbeknown even to him:

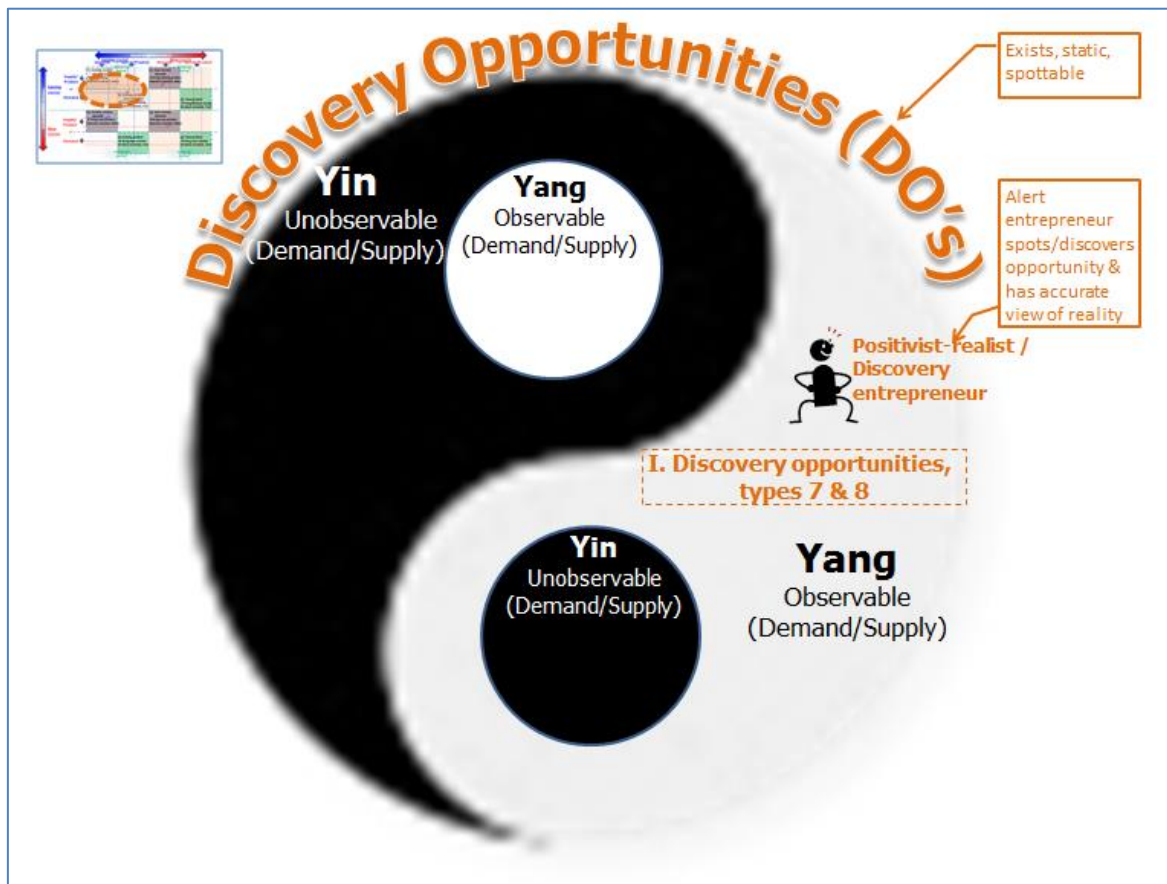
*“[T]o incorporate the notion that entrepreneurs’ **decisions** about how to recombine resources are **subjective** and **creative** [yin], without rejecting the role of objective [yang] forces in influencing the existence, identification, and exploitation of **opportunities**.”* (pp. 16, boldface added for emphasis, with the yin-yang characteristics correlated in square parenthesis)

Based on this line of reasoning, the three teleological approaches can still be relevant and retained to explain the epistemological formation and exploitation of the discovery, constructionist, and creation opportunity-types residing in three of the four opportunity-quadrants in Figure 3.6. Thus, the discovery approach explains Quadrant I's opportunity-type, and the constructionist and evolutionary-realist approaches explain Quadrants II's and III's respectively. The epistemological process for Quadrant IV's regression type of opportunities is not mentioned in extant literature, but is developed by this thesis in Paragraph (E) of Section 3.5.3.4. The following sub-section demonstrates how the teleological approaches explain the respective opportunity-types, with visualizations provided by the Taijitu of the yin-yang concept (see Section 3.3.2) on which the philosophical position of the conceptual O-O-P framework rests.

(A). Quadrant I – Discovery opportunities & entrepreneurial process

Arbitrageable discovery opportunities in Cells 7 and 8 of Figure 3.6's Quadrant I found in the *existing* marketplace are shown in the white *yang* portion of Taijitu in Figure 3.15.

Figure 3.15 – Discovery opportunities: formation & exploitation process



As mentioned in Paragraph (A) of Section 2.6.3.2, the existing market for arbitrageable discovery opportunities is in a state of equilibrium. The market and its practices are well established, so that very little innovation (if any) occurs. In Metcalfe's (2009) mind, discovery opportunities are common in "[m]any small businesses in the retail or catering trades . . . that . . . are devoid of novelty" (p. 4). Hardly any *endogenous* changes are expected in the existing marketplace, although from time to time there can be glitches at the microeconomic level, such as seasonal imbalances and/or temporary mistakes and incongruities (Drucker P. , 1985b). These microeconomic market disequilibria (Gaglio & Katz, 2001) provide imitation possibilities and/or *arbitraging* opportunities of types represented by Cells 7 and 8 as they require "purely simple, adaptive responses to changes in the pattern of relative prices" (Metcalfe, 2009, p. 4).

The opportunity formation and exploitation process is characteristically positivist-realist or discovery in epistemological tradition (see Paragraph (A) of Section 2.6.3.2 and Paragraph (C)(1) of Section 3.5.2.3). In general, information in the existing market is almost perfect as it is fairly well diffused. Uncertainty, if any, is “reduced to an expression of calculable risk” (Metcalf, 2009, p. 21). The entrepreneur needs only to be an “alert individual” (Kirzner, 1973) to spot and discover overlooked discovery opportunities *as is* without search (Kirzner, 1979), and then claim and exploit them by *arbitraging* demand and supply which are objective realities already *present, observable*, and known in the *existing* marketplace. Alternatively, the discovery entrepreneur wishing to conduct business can simply *imitate* existing ventures, much like the wholesale trades or neighborhood mom-and-pop retail stores that one finds.

From the perspective of Schumpeter (1934) therefore, the forming and exploiting of arbitrageable discovery opportunities is considered a ‘low’ level type of entrepreneurship. In fact, Shane (2012) goes to the extent of saying that discovery opportunities involve *no* entrepreneurship because little effort is required to recombine resources (Shane, 2012). In addition, while Alfred Marshall (1920) described business with such opportunities, he chose to omit them from his formal analysis of supply and demand²⁷.

Accordingly, this thesis’ empirical research will *not* cover arbitrageable discovery opportunities such as those residing in Quadrant I. Only startup-ventures with venture-opportunities in *high-velocity* industries (e.g., the high-technology sector) will be examined in this thesis. In general, the high-technology sector entails mezzanine and high levels of entrepreneurship that involves innovation as well as risk and uncertainty present in opportunities residing in the other quadrants.

(B). Quadrant II – Constructionist opportunities & entrepreneurial process

The formation and exploitation process for constructionist opportunities of Cell-types 2 and 4 in Figure 3.6’s Quadrant II is characteristically constructionist in epistemological tradition (see

²⁷ Quadrant I is excluded because it pertains to ‘discovered’ opportunities in the retail and wholesale industries that are characteristically ‘arbitrage’ activities and hence involve entrepreneurship levels that are considered ‘low’ in the view of Schumpeter (1934).

Paragraph (B) of Section 2.6.3.2 and Paragraph (C)(3) of Section 3.5.2.3). The antecedent root-origin (demand or supply) of constructionist opportunities is first perceived/interpreted by the constructionist-entrepreneur in the *existing* (yang) market (Alvarez, et al., 2010) *where* he is (i.e., within his existing environment), and with *what* he has as current resources (Alvarez, et al., 2010). The constructionist-entrepreneur's current resources will include information, experiences, a range of skills and views, as well as technical, and management knowledge (Foo, Wong, & Ong, 2005). The 'one side' that exists and is observable for his/her constructionist opportunity to be formed (Saravathy, et al., 2010), which is the root-origin (either demand or supply), is shown in the *observable* white yang area in Step #A of Figure 3.16's Taijitu.

Figure 3.16 – Constructionist opportunities: formation and exploitation process



The constructionist-entrepreneur would need *then* to “construct, deconstruct, and reconstruct an existing reality so as to form (conceive) a new reality and thus opportunity” (Alvarez, et al.,

2010, p. 27). In the context of the root-origin (either demand or supply) that exists and is observable, this implies that the entrepreneur would consider various instrumental-means, or the ‘other side’ that is yet unobservable (either supply or demand), as possibilities to form his/her constructionist opportunity. This is represented by the *unobservable* and yet unknown nebula of the black *yin*-dot (Step #B of Figure 3.16). The entrepreneur draws on his/her perception, cognitive beliefs, and interpretation to design, construct, and personalize the *new* instrumental-means, culminating in constructionist opportunity of Cell-types 2 and 4 being formed as a “self-fulfilling prophecy” (Alvarez, et al., 2010, p. 27) which, in a circular sense, molded his/her actions.

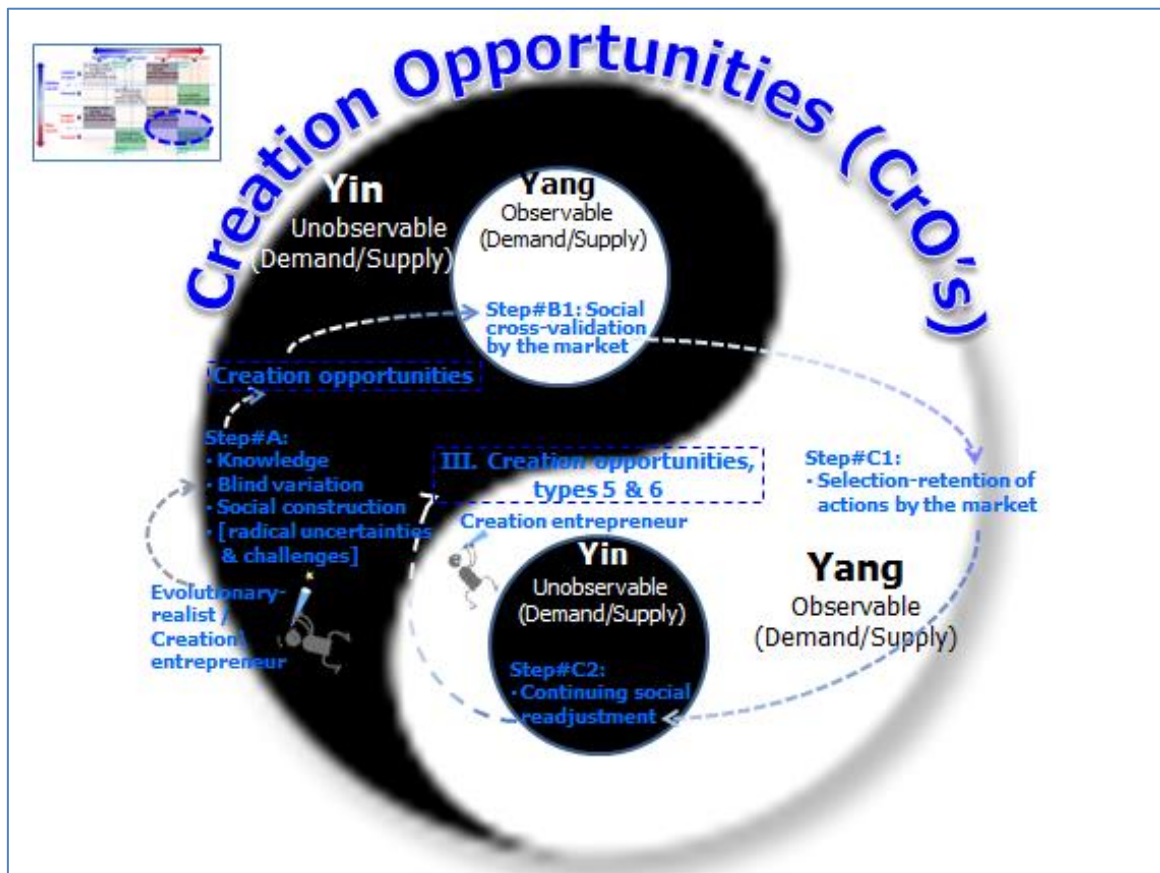
From the perspective of Schumpeter (1934), the formation and exploitation of constructionist opportunity is considered a ‘mezzanine’ level of entrepreneurship. Risk is involved on the side of root-origin, which already exists and is observable, while uncertainty is present on the side of instrumental-means, which is new, “unknown” (Sarasvathy, et al., 2010, pp. 82, Table 4.1 under "discovery opportunity"), and yet unobservable (see Quadrant II of Figure 3.6).

(C). Quadrant III – Creation opportunities & entrepreneurial process

The formation and exploitation process for creation opportunity-types 5 and 6 in Figure 3.6’s Quadrant III is characteristically evolutionary-realist in epistemological tradition (see Paragraph (C) of Section 2.6.3.2 and Paragraph (C)(2) of Section 3.5.2.3).

The antecedent root-origin (demand or supply) of creation opportunities is initially unobservable as the creation-entrepreneur is positioned at Step #A of the Taijitu in Figure 3.17. In other words, the creation-entrepreneur needs to grapple with uncertainties a market environment that is brand ‘new’ (*yin*) and unbeknown to him/her in the black *yin* tadpole area of the Taijitu. Hence, the level of uncertainty is extremely high because neither the root-origin nor instrumental-means exists or is observable. The creation-entrepreneur would need to imagine (Dimov, 2003), deploying some of his/her knowledge (Step #A of Figure 3.17).

Figure 3.17 – Creation opportunities: formation & exploitation process



However, imaginative ideas are plentiful (Hills and Shrader, 1998) and have to be evaluated externally. Hence, the entrepreneur would socially construct his actions based on blind variations and muddling through, with trial-and-error as the “raw materials” (Alvarez, Barney, & Young, 2010, p. 28 and 29) in the new (*yin*) environment (Step #A of Figure 3.17). The entrepreneur would wait for social cross-validations by the market, which itself is a “socially constructed entit[y]” (Alvarez, et al., 2010, pp. 29, footnote 2), to provide illumination and clarity to move forward (the white yang dot in Step #B1 of Figure 3.17).

Social validation can come from *informal* networks like family, friends, and business contacts (Birley, 1985). Other channels of getting social validation externally would be business plan competitions organized by universities (Foo, Wong, & Ong, 2005), industry-university social events (Huffman & Quigley, 2002), and so on. Such competitions and networking events provide the forum for entrepreneurs to ‘wire’/link into a network of *formal* contacts. They include

business angels, serial entrepreneurs, venture capitalists, professionals (like bankers, lawyers, accountants, and so on), and small business associations, which contribute resources like “equipment, space, and money . . . also advice, information, and reassurance” (Birley, 1985). Other contributions can come in the form of experiences, skills, views, as well as knowledge of technical and management matters (Foo, et al., 2005).

As the entrepreneur gathers demand and supply validations from the market, he/she would select-and-retain appropriate actions (Alvarez, Barney, & Young, 2010) using the knowledge gained (the white yang tadpole area per Step #C1 of Figure 3.17), and socially readjust to deal with unforeseen issues (the black *yin*-dot dot per Step #C2 of Figure 3.17). The entrepreneur then reiterate the entire entrepreneurial process until his/her formal start-up ideas culminate in the creation opportunity-types 5 and 6 in Quadrant III of Figure 3.6 being formed and manifested in the observable white *yang* environment in Caption III of Figure 3.17.

According to Buenstorf (2007), the different types of new combinations that Schumpeter (1934) described exemplify creation opportunities, which require a ‘high’ level of entrepreneurship to form and exploit because there are substantial uncertainties in the new/emerging markets where they originate (see Quadrant III of Figure 3.6). Venkataraman (1997) calls such endeavors a “strong premise of entrepreneurship” (p. 121).

(E). Quadrant IV – Regression opportunities & entrepreneurial process

The formation and exploitation process for opportunity-types 1 and 3 in Figure 3.6’s Quadrant IV does not fit any of the three epistemological discourses in extant literature. As mentioned in Paragraph (C)(4) of Section 3.5.2.3, the nature of these opportunities is the inverse of the constructionist opportunities’ in Quadrant II of Figure 3.6. For the purpose of this thesis’ conceptual O-O-P framework, the opportunity-types Quadrant IV are termed *regression* opportunities (see Paragraph (C)(4) of Section 3.5.2.3). Hitherto, scholars have not identified or mentioned them in extant literature.

A regression opportunity is a variant of constructionist opportunity with two exceptions. *First*, its antecedent root-origin (demand or supply) has yet to emerge, and therefore remains unobservable in the black yin tadpole area of the Taijitu in Figure 3.18. A *second* difference is that its instrumental-means is brought ultimately from the ‘known’ existing markets to meet the root-origin arising in new markets. Collating the two differences, it implies that the demand-related sources of change or supply-related sources of innovation manifesting as the root-origin of regression opportunities are triggered in new/emerging markets. However, they can be matched and satisfied by instrumental-means (whether supply or demand related, respectively) from existing markets. In this sense, there is a ‘back-peddling’ or ‘regression’ in terms of the level of creativity for regression opportunities.

Figure 3.18 – Regression opportunities: formation & exploitation process



Seen from a ‘regression’ teleological perspective, the entrepreneur would start-off first like the creation entrepreneur. When starting to form and exploit the regression opportunity (the black yin tadpole area per Step #A of Figure 3.18), the entrepreneur needs to grapple with uncertainties in a new environment that he/she does not *initially* comprehend, and try to comprehend a root-origin that is emerging. Like his/her creation counterpart, the regression entrepreneur needs to imagine (Dimov, 2003), apply some knowledge, and exercise his/her socially constructed actions through blind variations.

While waiting for a response from the market to illuminate and validate his/her socially constructed actions (Step #B1 of Figure 3.18), the regression entrepreneur back-peddles and falls back on ‘legacy.’ In other words, the entrepreneur resorts to his/her familiarity with the *known* environment where he/she had been and relies on the resources he/she has (represented by the observable white *yang*-dot in Step #B2 of Figure 3.18). In other words, the entrepreneur *regresses* and defers to the instrumental-means (of supply or demand) from *existing* market to match and satisfy the root-origin (of demand or supply respectively) in the new market when forming and exploiting the regression opportunity. Whereas the entrepreneur faces uncertainties initially, the profile of opportunity that is ultimately formed and exploited regresses into one that involves uncertainty on the one hand (when seeking to illuminate a yet unobservable root-origin in the emerging market), and risk (when bringing known and observable instrumental-means from the existing market) on the other. In this sense, the entrepreneurial process of regression entrepreneur follows effectuation logic by conjoining his/her initial creative idea with the Sarasvathian (2001) resources that he/she (see [Section 3.5.2.4](#)) possesses to form the regression opportunity (Caption IV in Figure 3.18), namely who he/she is, what he/she knows, and whom he/she knows.

The back peddling or regression by entrepreneur may be attributed to a number of reasons. These include:

- (a) a lack of confidence;
- (b) a desire to accelerate the ‘go-to-market’ process by relying on “[the use of] only business contacts, family, and friends [which makes] the entrepreneur . . . likely to

re-create the elements of previous employment, even when he was starting business in an entirely new market” (Birley, 1985, p. 108); and

- (c) a failure to get sufficient/satisfactory social validation on his blind variations from interacting with the environment.

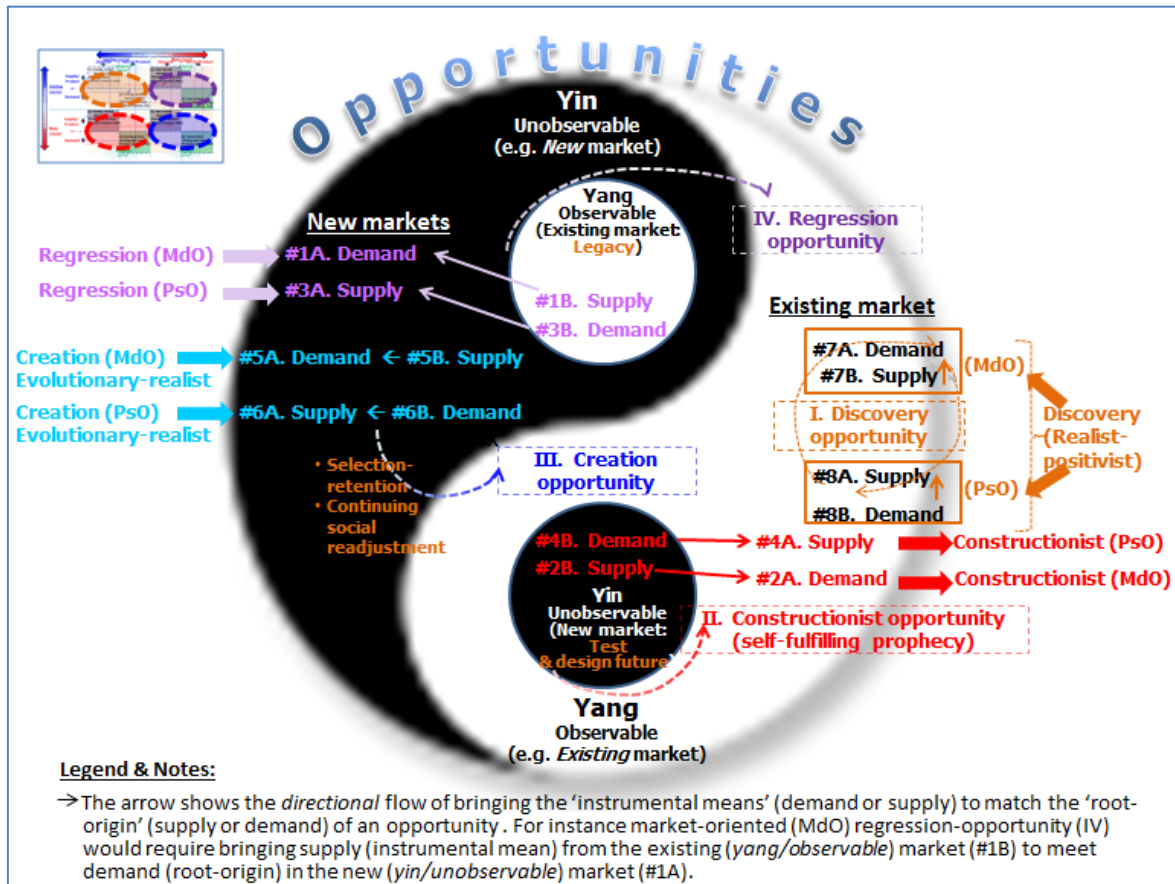
Like his/her constructionist counterpart, the regression entrepreneur invariably counts on what he/she has as three Sarasvathian resources, in terms of who he/she is, what he/she knows, and whom he/she knows. These may include “information, experiences . . . technical and management knowledge . . . a range of skills and views” (Foo, et al., 2005, p. 387), as well as “equipment, space, and money . . . also advice . . . and reassurance” (Birley, 1985, p. 107). In addition, like the constructionist counterpart, the [regression] entrepreneur “is not necessarily concerned with breaking new ground; opportunity can also be found in a new mix of old ideas or in the creative application of traditional approaches” (Roberts, et al., 2007, p. 6; Stevenson, 2006, p. 6). As a result, the regression entrepreneur ends up being like the constructionist entrepreneur who *personalizes* his/her venture-opportunity, albeit one that is *not* a self-fulfilling prophecy, because it was *not* the starting intent. Nonetheless, while his/her back peddling dilutes the initial creativeness of the venture-opportunity, it also reduces its profile from being *all* uncertain to a mix of certainty and risk. The result is a regression opportunity fulfilled and effectuated (Sarasvathy, 2001). From the perspective of Schumpeter (1934), the teleological approach of forming and exploiting regression opportunity is considered a ‘mezzanine’ level of entrepreneurship that carries both the risks of existing market and the uncertainties of new/emerging market (Quadrant IV of Figure 3.6).

(F). Integrated teleological approaches

The Tajitu in Figure 3.19 below aggregates the four teleological approaches (discovery/positivist-realist, constructionist, regressionist, and evolutionary-realist) that explain the epistemologies of forming and exploiting the eight types of opportunities as nexuses of root-origin and instrumental-means interacting in different market settings or yin-yang ontological environments. The unbroken straight-line arrows in Figure 3.19 signify the orientations of

instrumental-means (either supply or demand, denoted by “#B”) towards the root-origins (either demand or supply, denoted by “#A”) that emerge from the respective existing (white yang) or new (black yin) marketplaces.

Figure 3.19 – Integrated teleological approaches: forming & exploiting opportunities



It is evident from the discussions that the yin-yang Taijitu helps the conceptual O-O-P framework to add significant understanding and analytical richness on the ontological nature of different *types* of opportunity in various *market-settings/yin-yang environments* with different degrees of *observability* in the natural world, and the epistemology of how opportunities are formed and exploited as a *process*. First, it helps to distill the regression approach as the *fourth* epistemological tradition hitherto not identified and mentioned in extant literature (see [Paragraph \(E\) of Section 3.5.3.4](#)). Without the regression perspective, the three extant views will fall short

of representing the full continuum of epistemologies that explain the forming and exploiting of opportunities with different yin-yang/market ontological nature.

Second, the Taijitu provides the contextual perspective to rationalize the four teleological approaches *not* as discrete, standalone, or mutually exhaustive concepts. Rather, it demonstrates that *each* of the approach can explain and account for the epistemological process of different *types* of *market-opportunity* (discovery, constructionist, creation, or regression) when recontextualized, reframed, and integrated in the yin-yang duality universe. They will be free from the paradoxical encumbrances hitherto imposed by the legacy ‘either/or’ theoretical logic if the objectivists and subjectivists. In fact, the ‘both/and’ yin-yang philosophy makes each approach *teleologically coherent* in explaining the epistemology of the respective market-opportunities, each of which is a *nexus* of demand and supply antecedents having different yin-yang states/manifestations (see [Section 3.4.2.3](#), Figure 3.6 and Figure 3.19). From each market-opportunity, multiple *subsets* of entrepreneurial venture-opportunity possibilities²⁸ can be formed and exploited by the individual entrepreneur in the IO-nexus of entrepreneurial process. The yin-yang duality philosophy therefore rationalizes, operationalizes, and generalizes both the opportunity construct as well as the IO-nexus as dualistic notions.

3.6 Chapter summary

This chapter details the systematic process of applying the yin-yang duality concept to operationalize the construct of *opportunity and* then the *IO-nexus* notion of entrepreneurial process for the conceptual O-O-P framework of this thesis. To facilitate exposition and understanding, the Taijitu and opportunity-hexadecadrant are used as visualization and rationalization tools in developing the framework.

The yin-yang perspective is chosen as the *metatheoretical foundation* (see [Sections 3.2](#) and [3.5.1](#)) because its ‘both/and’ philosophy best describes and explains natural phenomena in the

²⁸ This is consistent with the transformational (temporal, evolving), malleable, multiplicative, and divisible dimensions of the dynamic duality tenet. See [Section 3.4.2](#).

universe. It posits each market-opportunity as presenting possibilities for multiple venture-opportunities to be formed as subsets by start-up entrepreneurs. In essence, a market-opportunity reflects dualistic environmental forces in a state of disequilibria (tenet of dynamic duality). The environmental forces are demand and supply related sources of change described in extant literature (Bhave, 1994; Drucker, 1985b; Kirzner, 1997; Schumpeter, 1934; Van de Ven, 1986). In other words, a market-opportunity can be generalized ontologically as a nexus comprising the two dimensions (McMullen, et al., 2007) of demand and supply (tenet of holistic duality tenet²⁹) having different yin-yang manifestations that change spatially and temporally (tenet of dynamic duality³⁰). Although they exist as *opposites*, they interact interdependently with each other (tenet of dialectical duality³¹) in various ends (root-origin) and instrumental-means relationships in the “product markets” (Shane & Venkataraman, 2000, p. 220), which is the focus of this thesis (see Section 3.4). Their interactions result in different nexuses of DS/SD interrelationships, which constitute market-opportunities having different yin or *yang* states/manifestations of *observability*, *knowability*, and *detectability* mirroring that of their respective dualistic constituents (see Figure 3.4).

Having thus operationalized the opportunity construct, the Tajitu is then used to visualize how the three traditions in extant literature can be reframed, re-contextualized, and integrated in the yin-yang universe of the conceptual O-O-P framework. Specifically, the Taijitu shows how the discovery/positivist-realist, constructionist, and evolutionary-realist approaches can be retained to explain the epistemological formation and exploitation of the discovery, constructionist, and creation opportunity-types coherently and consistently without being paradoxical (see Section 3.5.3.4). In the reframing process, the *regression approach* is identified as a new perspective to explain how a fourth type of opportunity—the regression opportunity—hitherto not discerned or discussed in seminal works (see Paragraph (E) of Section 3.5.3.4) can be formed and exploited (see Figure 3.19). The revelation of *regression* as a fourth epistemological approach provides a

²⁹ i.e., systematic and inclusive.

³⁰ i.e., transformational (temporal, evolving), malleable, multiplicative, and divisible.

³¹ i.e., paradoxical and dualistic.

complete and holistic suite of teleological discourses regarding how four different types of market-opportunity with dissimilar ontological origins are formed and exploited by start-up entrepreneurs in the dualistic IO-nexus of entrepreneurial process.

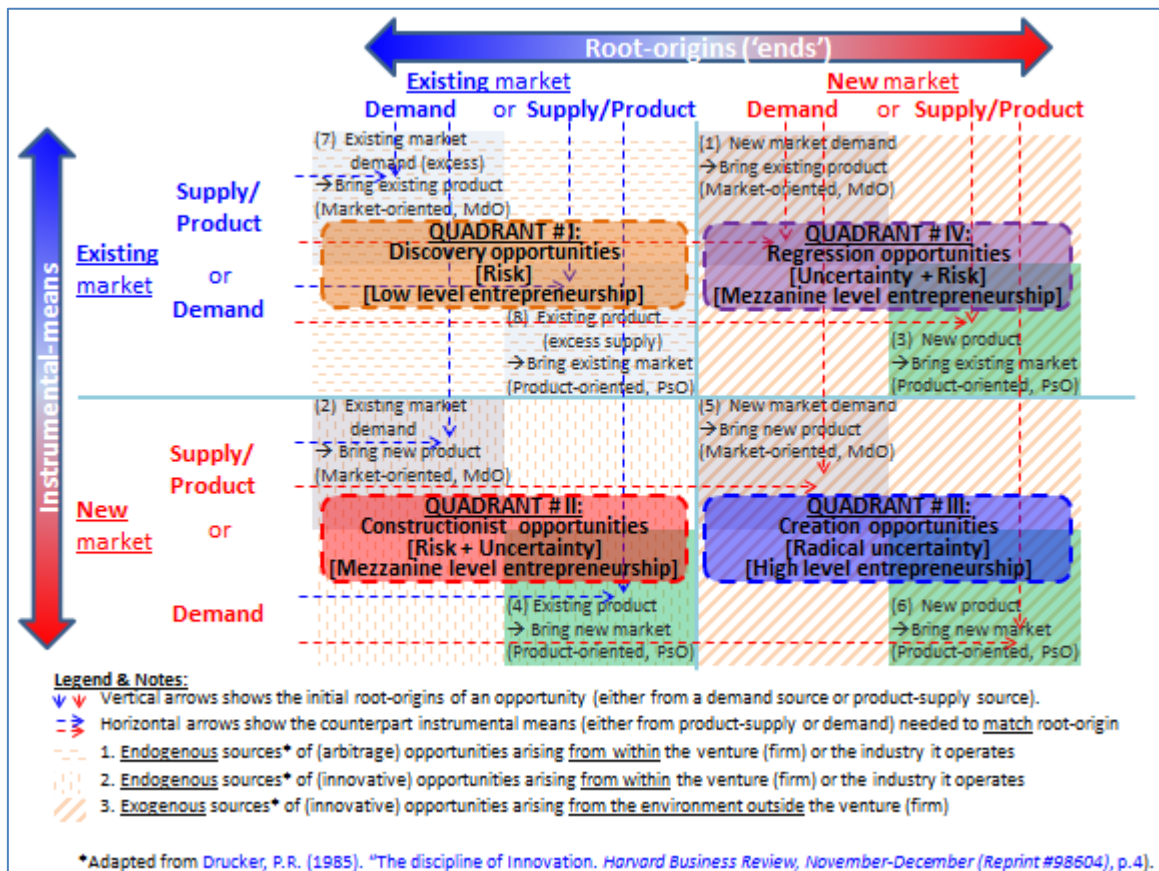
Market-opportunity is dynamic and *not static*, unlike discovery opportunity of the positivist-realist tradition (see Paragraph (A) of Section 2.6.3.2). It is also *not* a subjective *aftermath* as posited by the constructionists and evolutionary-realists. In the yin-yang universe, market-opportunity is *malleable* and *divisible* into *multiple subsets* (tenet of dynamic duality), which are *venture-opportunities* (see Paragraph (A) of Section 3.5.2.3) that start-up entrepreneurs can interact with in the IO-nexus of entrepreneurial process. This knowledge regarding the nature of opportunity lends theoretical and operational support to scholarly assertion that “an *entrepreneurial* [venture] opportunity is more accurately described as an opportunity to engage in *entrepreneurial* action, in which *entrepreneurial* denotes a *sub-class* of some broader category of human action” (Companys & McMullen, 2007, p. 303) to form and exploit opportunities in different yin-yang market-settings.

Hitherto, entrepreneurship scholars have considered the *possibility* that opportunity exists in multiple forms (Alvarez & Barney, 2007; Sarasvathy, et al., 2010) but gave no specifics. In contrast, the yin-yang notion of market-opportunity as a dualistic nexus of demand and supply forces interacting in ends-means relationships serves more than just revealing *four* types of opportunities, each with specific epistemological traditions that relate to a particular market setting. The revelation that either demand and supply can play the role of ends (root-origin) or instrumental-means when interacting with each other (cast in opposite roles) would suggest the existence of two market-opportunity possibilities for each of the four epistemological process inherent in the respective quadrants of the conceptual O-O-P framework’s opportunity-hexadecadrant, making for a total of eight types of market-opportunity.

As visualized in Figure 3.20, which is a composite of Figure 3.6 and Figure 3.11, each of the four quadrants in the opportunity-hexadecadrant can also be associated with varying ‘levels’ of entrepreneurship, ‘degrees’ of innovation, and ‘risk-uncertainty profiles’ (see Sections Paragraph (C) of Section 3.5.2.3 and Paragraph (D) of Section 3.5.2.3). Scholars have hitherto mentioned these concepts (Metcalf, 2009; Schumpeter, 1934), but did not manage to assess

these variations (Davidsson, 2004), which the conceptual O-O-P framework can answer with its opportunity-hexadecadrant.

Figure 3.20 – Opportunity-hexadecadrant: Orientations, Schumpeter & Metcalfe notions of entrepreneurship/innovation, and risk-uncertainty



The other contribution that the opportunity-hexadecadrant of conceptual O-O-P framework makes to literature is in highlighting the unique role of root-origin in determining the *orientation*, either market or product, of its market-opportunity (see Paragraph (E) of Section 3.5.2.3). In addition, the root-origin is also identified as the isomorphic *a priori* venture-outcome that orientates the entrepreneurial process when bringing the instrumental-means for its fulfillment (see Section 3.5.3.2).

In summary, the yin-yang duality philosophical perspective enables the conceptual O-O-P framework to coherently rationalize, generalize, and operationalize the opportunity construct, its

antecedents, and the way it orientates the entrepreneurial process in the IO-nexus of interaction with the individual. It heralds a number of implications for research, practical, and policy-making on entrepreneurship as a distinctive domain. *First*, it helps to order the causal relationships in the entrepreneurial process as antecedent → end → means (A-E-M), and operationalizes them as *opportunity* (root-origin) → *venture-outcome* → entrepreneurial *process* (O-O-P). *Second*, it reveals that venture-outcome can be determined *ex-ante* to the entrepreneurial process, thereby resolving the ends-means or means-ends circularity dilemma that rattles research work. In turn, the unveiling of an *a priori* venture-outcome provides the basis to assess objectively the *a posteriori* performance or actual outcome, which is adulterated by entrepreneur's goals and environmental factors (see [Section 3.5.2.4](#)). The conceptual O-O-P framework of this thesis therefore sets forth the IO-nexus notion as an *a priori* theory.

Chapter 4 – METHODOLOGY

4.1 Introduction – Overview of research methods and methodologies in seminal works

The *nature of inquiry* that pertains to this research is discussed in this chapter. Specifically, the chapter *examines* the research approach taken to investigate the explanations of the O-O-P framework that have emerged logically from the stock of extant knowledge. In general, the relevance and appropriateness of the *approach* for research inquiry depends on the gaps, concerns, and problems that have been identified in literature (Bryman & Bell, 2007). They inform the *research questions* to be answered (see [Section 4.2.3](#)). The research questions in turn determine the *research method* and the *research methodology* that are suitable for the investigation (see [Section 4.2](#)).

4.2 Considerations for the methodology of this research

The chapter sub-sections that follow will begin with a discussion on the *nature* of this research (see [Section 4.2.1](#)) and its *objectives/purposes* (see [Section 4.2.2](#)). The discussion helps to determine the pertinent *questions* to ask ([Section 4.2.3](#)) for this research to achieve its objectives. This provides the foundations for setting the research *methodology* to guide the investigation ([Section 4.2.4](#)) in terms of the appropriate research method to use (see [Section 4.2.5](#)).

4.2.1 Nature of this research

As summarized in [Section 2.9](#), the interrogation made of entrepreneurship literature reveals a number of issues, which Bryman and Bell (2007) would characterize as common in seminal works, and therefore can be categorized as follows:

- (a) Incomplete. The existing literature is not fully complete. There are many gaps in explaining the entrepreneurship phenomenon, with variables like outcome,

influence of environmental factors, orientations, and causality patterns not fully accounted for or explained in the nexus of entrepreneurial process between opportunity and the individual.

- (b) Inadequate. The existing literature on the entrepreneurial phenomenon is fragmented and divisive, in terms of perspectives and definitions. There is therefore a lack of an integrated theory on entrepreneurship.
- (c) Incommensurate. There is a need for an alternative philosophical paradigm that is superior to the objectivist and subjectivist perspectives adopted by entrepreneurship scholars in their definitions and views regarding ‘opportunity’ in extant works. There are “intractable differences” (McMullen, et al., 2007, p. 279) and paradoxes in their explanations, caused by the ‘either/or’ theoretical views. An embracive ‘both/and’ philosophical paradigm such as the yin-yang notion is needed for an integrated theory of entrepreneurship to be possible.

To address these issues, this thesis submits its conceptual O-O-P framework to complement and operationalize the IO-nexus notion in explaining the start-up entrepreneurial process at the new venture level. The yin-yang duality concept is used to base its philosophical paradigm. The *logical-deductive* discussion in Chapter 3 demonstrates that the yin-yang notion is able to provide theoretical generalizations regarding the ontological nature and existence of market-opportunity as an objective duality construct having holistic, dynamic, and dialectical characteristics that allow it to interact with the individual-actor of the IO-nexus. Moreover, the ‘both/and’ spirit of the yin-yang duality paradigm has the capacity to *harmonize* the definitions and explanations in extant literature that are premised on the received Western ‘either/or’ logic.

When integrated into the conceptual O-O-P framework for the IO-nexus notion, the yin-yang notion with its duality tenets help to rationalize, describe, explain, and generalize the different dimensions of the entrepreneurship phenomenon and its variables. Currently, the extant definitions and explanations are ambiguous, mutually contradictory, paradoxical, and vary considerably in perspectives (Hansen, et al., 2011). They are handicapped by the dialectical ‘either/or’ theoretical views of the objectivists and subjectivists. Nonetheless, the dilemma can be

resolved once the existing seminal views become part of the holistic integrated theory that the conceptual O-O-P framework provides on start-up entrepreneurship.

As visualized in Figure 3.12, the analytical generalizations of the conceptual O-O-P framework have emerged deductively by recontextualizing extant stock of seminal knowledge in the universe of the yin-yang duality paradigm. The framework explains *how* the entrepreneurial processes/activities unfold over time for *a startup-venture* with a particular type of opportunity, and *how* the opportunity's root-origin orientates the unfolding. In particular, the framework explains the ontological existence of the opportunity construct and operationalizes it as comprising eight DS/SD nexuses, which are categorizable into the four opportunity-types (discovery, constructionist, creation, and regression). For each opportunity-type, a certain level of entrepreneurship, innovation, as well as risk and/or uncertainty can be identified (see the opportunity-hexadecadrant in Figure 3.6). Each opportunity-type reflects endogenous and exogenous sources of change manifesting through demand or supply, which is the root-origin of opportunity. The root-origin's orientation is thus either MdO or PsO. In this connection, the conceptual O-O-P framework highlights the unique isomorphic role of the antecedent root-origin in defining the venture-outcome (demand or supply) to be fulfilled by bringing the instrumental-means (supply or demand). Accordingly, the orientation of opportunity along with the entrepreneurial process of its formation and exploitation follows that of its root-origin (see Figure 3.11). Furthermore, the root-origin orders the causality relationships among the core variables as $A \rightarrow E \rightarrow M$, being opportunity (root-origin) \rightarrow venture-outcome \rightarrow process. Such knowledge is invaluable to start-up entrepreneurs as it provides them with the direction and *a priori* venture-outcomes for the respective opportunities they pursue.

As may be noted from the above discussion, the explanations regarding the nature of the core variables and relationships have been naturally deduced/identified and operationalized *without* context stripping (i.e., selective *stripping* through appropriate controls or randomization of other variables from contextual consideration), which ordinarily is intended to avoid significant alterations to findings (Guba & Lincoln, 1994). Rather than context stripping, the conceptual O-O-P framework *per se* is inclusionary. Therefore, neither the *theoretical rigor* of the O-O-P framework is compromised, nor its *relevance* in terms of *applicability* and *analytical*

generalizability. For instance, the environmental sources of change that trigger opportunities are innate in the root-origins of the opportunity construct without needing auxiliary provision.

4.2.2 Objectives/purposes of this research

As discussed above, the conceptual O-O-P framework is developed to address extant explanations in literature, which are found to be incomplete, inadequate, and incommensurate in regard *how* the start-up entrepreneurial processes/activities in the IO-nexus unfold over time. Hence, the ultimate inquiry objective here is *explanation* (Guba & Lincoln, 1994), specifically to verify whether empirical evidence is generalizable analytically (Yin, 1994) to the O-O-P framework's explanations regarding the *nature* and *functioning* of the entrepreneurial process undertaken by a startup-venture for its opportunity. The startup-venture is the *unit of analysis* for purpose of this research work. Empirical evidence gathered from the research will be verified³² against the *explanations* of the conceptual O-O-P framework, which have been systematically deduced as described in the preceding section.

If the explanations of the conceptual O-O-P framework are substantiated to be *analytical generalizations* of the entrepreneurial process, they can add to the stock of theory (Raddon, 2010), facilitating explanation, prediction, and control of the start-up phenomenon (Guba & Lincoln, 1994).

4.2.3 Research questions to achieve the research aims

Given the objective of this research to verify the analytical generalizability of the O-O-P framework's functional nature and its explanations, the pertinent research questions to ask in the line of inquiry will cover two key areas. The first relates to *how* the start-up entrepreneurial *process* unfolds *over time* in respect of the formation and exploitation of opportunity; and the second concerns *what* are the ends and means of the entrepreneurial process. The specific

³² Positivism focuses on efforts to verify, while postpositivism falsifies, *a priori* hypotheses, most usefully stated as mathematical (quantitative) propositions or propositions that can be easily converted into precise mathematical formulas expressing functional relationships (Guba & Lincoln, 1994).

research questions that address the two areas are given below (which are reproduced from Section 1.4).

- RQ1. What is the ontological nature of entrepreneurial venture-opportunity?*
- RQ2. What are the different types of start-up entrepreneurial venture-opportunity?*
- RQ3. How are the various types of start-up entrepreneurial venture-opportunity formed and evaluated?*
- RQ4. What are the relevant venture-outcomes for the various types of start-up entrepreneurial venture-opportunity?*
- RQ5. How are the venture-outcomes for the various types of start-up entrepreneurial venture-opportunity formed?*
- RQ6. How do the venture-outcomes get oriented and prioritized?*
- RQ7. What are the actions and processes taken in connection with the respective venture-outcomes?*
- RQ8. How does the entrepreneurial process get oriented?*
- RQ9. What are the factors that might moderate or change the venture-outcomes and the entrepreneurial process taken to achieve the venture-outcomes?*

These research questions (shown also in Section 1.4) correspond to the *gaps* and *problems* identified in extant literature relating to extant works being incomplete, inadequate, and incommensurate when explaining “how things really are” and “how things really work” (Guba & Lincoln, 1994, p. 108) for the start-up entrepreneurial process.

4.2.4 Methodology chosen for this research

In light of the research questions, the basic posture of this research's methodology would be to facilitate the objective of discovering answers from empirical findings. The answers can then be *verified* to see if they are generalizable analytically to the explanations that have been logically deduced by the conceptual O-O-P framework for the IO-nexus notion to be an integrated “coherent theory” (Guba & Lincoln, 1994) on how the start-up entrepreneurial process works. Hence, a positivist paradigm for the methodology of research inquiry (Schwandt, 1994) will be appropriate, with the objective of guiding the goal of gaining knowledge and providing a literal account of *what* the world of startup venturing is and *how* the process works.

In line with the *logical-positivist* blueprint, the following three paradigm-defining attributes of ontology, epistemology, and methodology (Guba & Lincoln, 1994) will guide the line of inquiry:

- (a) A *naïve realism* ontology focuses the researcher's line of inquiry on verifying whether the empirical findings are analytically generalizable to the conceptual O-O-P framework's *explanations* regarding the core variables, their relationships, and “cause-effects” (Guba & Lincoln, 1994) in the entrepreneurial process that ought to exist as logically *deduced* from the yin-yang duality concept and extant stock of seminal knowledge. For instance, ‘opportunity’ with its root-origin (either demand or supply) in the yin-yang universe of the conceptual framework is deduced to be an objective reality that exists and is essentially there for study. A positivist inquiry paradigm is therefore useful and appropriate to ascertain “how things really are” and “how things really work” (Guba & Lincoln, 1994, p. 108). If opportunity, along with the outcome and entrepreneurial process that it orientates, does exist independently, the researcher will come to know the ‘facts’ as they are.
- (b) In line with the ontological position's realism, the epistemology for research is *dualistic* and *objectivist*. The researcher and the investigated startup-venture (as the unit of analysis, or object of inquiry) are “independent entities” (Guba & Lincoln, 1994, p. 110). The researcher will assume a posture of objective detachment or value-freedom. He will maintain an independent role when studying the startup-

venture, “without influencing or [be] influenced by it” (Guba & Lincoln, 1994, p. 110). This helps the researcher to gain knowledge and understanding on the O-O-P framework as a single integrated working model. It also helps him/her to *verify* whether the conceptual framework can “coherent[ly]” (Guba & Lincoln, 1994) explain the start-up entrepreneurial phenomenon in practice – i.e. “how things really are” and “how things really work” (Guba & Lincoln, 1994, p. 108), which are reflected in the research questions shown in Sections 1.4 and 4.2.3.

To ensure that personal values and biases do not influence the outcomes, the researcher will be rigorously follow various strategies (Guba & Lincoln, 1994) and investigation procedures when conducting the research inquiry as explained in the subsection below. This ensures that the *validity* and *replicability* of findings “are, in fact, true” (Guba & Lincoln, 1994, p. 110).

- (c) As will be elaborated in Section 4.2.5, *qualitative* research method using case study is most suited to the positivist research methodology. It is able to provide the “*contextual information* and rich *insight* into human behavior” (Guba & Lincoln, 1994, p. 106). In addition, case study research “is useful for uncovering elicited emic [insider] views” (Guba & Lincoln, 1994, p. 106). Moreover, it helps to avoid the “ambiguities” (Guba & Lincoln, 1994, p. 106) of quantitative methods (see Section 4.2.5.1). Given the proximal *distance* and *dyadic* interaction that is inherent in a *qualitative* approach between the researcher and the startup-venture (the *object* of investigation), several measures will be taken by the researcher to avoid breaching or compromising the epistemological tradition (i.e., *objective detachment* or *value-freedom*) of this research.

First, the researcher as investigator will ask simple, non-confounding questions to prevent outcomes from being improperly influenced (Guba & Lincoln, 1994). This precludes facts from being laden with the researcher’s perspectives or *values* (Guba & Lincoln, 1994). Moreover, if follow-on questions are posed in connection with the respondent’s input, the purpose will merely be to seek clarification,

explanations, as well as to “elicit examples, illustrations, and other insights” (Kohli & Jaworski, 1990, p. 2).

Second, the researcher will avoid ladening research with *theory* as it can subvert and impair the *objectivity* of empirical findings, and cause “facts” to be determined and viewed by the researcher and the respondent only through their own theory window. Theory-ladening of facts can happen when, as Blumer (1954) describes, preordained schemes or concepts³³ considered “definitive” are imposed on research. A definitive concept refers to “what is common to a class of objects, by the aid of a clear definition in terms of attributes or fixed bench mark” (Blumer, 1954, p. 7). Simply put, a definitive concept subsumes only what is common to the phenomenon being inquired. The *concept* that has been developed is then fixated, elaborated, and operationalized into common *indicators* and programmatic statements, which then become measures of the original concept.

In *quantitative* positivist research inquiry, or the “received view of science” (Guba & Lincoln, 1994, p. 106), the imposition and translation of a definitive concept into indicators is called the concept-indicator³⁴ *modus operandi*, which is exemplified by the conversion of propositions into “precise mathematical formulas expressing functional relationships” (Guba & Lincoln, 1994, p. 106). Such ends-influencing-means tautology commonly happens in practice. Hence, theory-ladenness of facts cause theories and observed facts to become interdependent:

“[Observed] facts are facts only within some theoretical framework. Thus, a fundamental assumption of the received [quantification] view is exposed as dubious. If hypotheses and observations are not independent, “facts”

³³ Concepts are building blocks of theory and represent the points around which business research is conducted (Bryman & Bell, 2007).

³⁴ Indicators provide a measure of a concept (often referred to as an operational definition, a term deriving from the idea of operationalization) (Bryman & Bell, 2007, p. 159).

can be viewed only through a theoretical 'window,' and objectivity is thereby undermined.” (Guba & Lincoln, 1994, p. 107)

Blumer (1954) is critical of *quantitative* methods and warns social researchers to refrain from imposing “definitive” concepts, as it will inadvertently straightjacket the social world.

“[T]he conventional economic methods and procedures are rather obviously inappropriate to the successful investigation of social reality” (Lawson, 1997, p. xiii), and “by and large unfit for the study of ontologically complex systems comprising unpredictable human and social behavior” (Ramoglou & Tsang, 2016, p. 412).

Hence, Bygrave (1993) counsels:

“(Actually, we should be very suspicious of any model that accounts for all the facts. Simply because mathematical tools demonstrate relationships under a given set of conditions does not mean that we have a useful model. A good model ought to be able to make predictions about facts that had not been specifically put into it.) And above all else, any theory of entrepreneurship must be rooted in the social sciences of psychology, sociology, economics, and politics.” (p. 258)

The problems noted above can be eliminated, or at least alleviated, by methods-level accommodation that involves a greater use of *qualitative* data (Guba & Lincoln, 1994). Qualitative data can help to redress the shortcomings of quantitative methods of inquiry.

For the reasons given above, the research undertaken herein is *qualitative* in nature using multiple-holistic case study method (see [Section 4.4.3](#)); it is not *quantitative*, which Blumer (1954) and other scholars criticize. Nonetheless, the researcher acknowledges that the logically deduced propositions of the O-O-P framework, which inform the research questions, run the risk of becoming the archetypal

definitive concepts that creep into the case interview process. To allay Blumer's (1954) concern, the researcher will employ the following research tactics:

- (i) Wording of field questions (FQ or FQs as the context permits). The researcher will develop an *interview guide* with FQs having a language in the line of inquiry that is dialectically *independent* (Guba & Lincoln, 1994) from the theoretical/conceptual jargon of research questions to which they correspond (see Paragraph (C)(1) of Section 4.4.5.5). Simple, common, and layperson language will be used as much as possible in framing the FQs. The researcher will refrain from using theoretical vernaculars/lingos of the O-O-P framework. This *framing tactic* helps to ameliorate (if not prevent) the research findings and outcomes from being improperly influenced (Guba & Lincoln, 1994), and/or being tainted or compromised by theory-laden facts (Guba & Lincoln, 1994), and from the imposition of definitive concepts (Blumer, 1954).
- (ii) Encouraging “sensitizing” concepts and perspectives. Other than dialectical language, the FQs will also employ a mix of the “*what*” and “*how*” interrogative pronouns to draw “sensitizing” concepts from the qualitative case study research (see Paragraph (C)(2) of Section 4.4.5.5). In this connection, “sensitizing” concept is one that lacks “specification of attributes or bench marks and consequently it does not enable the [researcher] to move directly to the instance and its relevant content” (Blumer, 1954, p. 7). The interrogative pronouns keep the FQs open-ended in the line of inquiry. At the same time, they provide a general sense of reference and direction that guide the researcher in eliciting *sensitizing* concepts from the informants on various aspects of the start-up entrepreneurial phenomenon. Aside from that, the researcher also lets the interview process unfolds naturally as each situation warrants. There is therefore no preordained sequence in the line of inquiry, thus allowing a variety of sensitizing perspectives and viewpoints to emerge (Bryman & Bell, 2007).

Taken together, the two field tactics help to avert the definitive concepts from being imposed on empirical facts, while simultaneously allow *sensitizing* concepts to be generated from the qualitative case study method adopted for this research. The sensitizing concepts can then be compared to the definitive concepts of the O-O-P framework. By following Blumer's (1954) distinction between definitive and sensitizing concepts therefore, this research will be able to capture different aspects of the entrepreneurial process as a phenomenon (1) conceptualized by the O-O-P framework, and (2) uncovered by qualitative research.

4.2.5 Choice of research method

There are a number of methods to choose for research work. For research method to be most effective, it "must be fitted to the predetermined *methodology*" (Guba E. , 1990, p. 108).

4.2.5.1 Rationale for selecting qualitative method

Based on the discussions above, quantitative methods do not suit the methodology of this research despite its positivist orientation. Quantitative forms of research are rarely able to capture the multivariate perspectives of the entrepreneurial phenomenon needed to verify the explanations of the O-O-P framework. This is because quantitative research relies on empirical materials that are "more remote and inferential" (Denzin & Lincoln, 1994a, p. 5). They usually require a large number of randomly selected cases to derive statistical and often times probabilistic generalizations, which are ambiguous (Guba & Lincoln, 1994). Even then, they are seldom able to accurately depict and explain the start-up phenomenon as a *process*, as well as the context and reason for the changes in, and connections between, the variables *over time* (Bryman & Bell, 2007). Thus, quantitative research tends to present static images or abstractions (Bryman & Bell, 2007; Denzin & Lincoln, 1994a) of the entrepreneurial phenomenon, emphasizing only the relationships between variables at a certain point of time. It is seldom able to study the phenomenon directly or account for the context in which it occur (Denzin & Lincoln, 1994a).

Therefore, quantitative methods are less suitable for collating the contextual information needed to verify and validate the *nature* and *functioning* of the O-O-P framework.

In contrast, qualitative method is ideal for the particular *objective* of this research, which is to provide empirical evidence that reveals and explains the “nature and functioning” (Bryman & Bell, 2007) of the startup-venturing phenomenon and *verifies* (positivism) the *explanations* of the O-O-P framework (see Section 4.2.2). Qualitative methods are central to theory-building (Shah & Corley, 2006) especially for exploring the holistic content and dynamic process (Martin & Eisenhardt, 2010). Qualitative research methods can identify more closely and deeply the phenomenon from a startup-venture’s perspectives through detailed interviewing and observation (Denzin & Lincoln, 1994a). This enables the capturing of “contextual information” (Guba & Lincoln, 1994, p. 106) to provide thick descriptions (Marshall & Rossman, 1995) on the opportunity-venturing events as they “unfold over time” (Bryman & Bell, 2007, p. 426), and *richer insight* into behavior (Guba & Lincoln, 1994). This includes explanations on the various *processes*, events, actions, outcomes, as well as the patterns and causality linkages among the *core* variables of the startup-venturing process (Denzin & Lincoln, 1994a).

As Miles and Huberman (1994) contend,

“[Q]ualitative studies are especially well suited to finding causal relationships; they can look directly and longitudinally at the local processes underlying a temporal series of events and states, showing how these led to specific outcomes, and ruling out rival hypotheses. In effect, we get inside the black box; we can understand not just a particular thing happened, but how and why it happened.” (p. 434)

Nonetheless, there may be some uneasiness in the use of qualitative research methods to verify the conceptual O-O-P framework and its propositions regarding the start-up entrepreneurial phenomenon. In the normal qualitative research tradition, data collection and analysis typically precede the development of theory and categorization. However, some scholars like Silverman (1993) have argued that the *conventional* portrayal of the research→theory relationship in qualitative research is misaligned.

“[It is] out of tune with the greater sophistication of contemporary field research design, [which is] born out of accumulated knowledge of interaction and greater concern with issues of reliability and validity.” (Bryman & Bell, 2007, p. 404).

Research strategy can assume a variety of forms, and the choice of qualitative research methods to verify the conceptual O-O-P framework is one of these forms. And as will also be shown, *case study interviews* as the method chosen for this research fits the objective of this research (see Section 4.2.2) and is consistent with the research methodology that is needed to achieve the research objectives (see Section 4.2.4). Moreover, the field strategies embedded in the case study method for this research uphold the evaluation criteria of internal and external validity, and stress reliability and rigor (in terms of replications, diversity of selected cases, objectivist research epistemology, interview protocol, and framing of field questions).

Summing up the discussion above, there are sufficient justifications to support the use of qualitative methods as part of the research strategy for the positivist inquiry to verify empirically the explanations developed by this study’s O-O-P framework. Qualitative methods provide quality, depth, and richness in research findings, as well as a thick description, critical for the gathering of *appropriate contextual data* for the research in progress. The ability to obtain rich information makes qualitative methods useful and appropriate for this research. Nonetheless, conscientious efforts will be made to free the inquiry from individual bias, subjectivity, and unreliable impressions that are typically associated with qualitative research methods.

4.2.5.2 Case study as this research’s method

There is an array of methods for conducting *qualitative* research in social science. They generally fall into five categories, viz. experiments, surveys, histories, archival analysis, and case study (Creswell, 2009). Yin (1994; 2009) proposes three criteria to help with the choice of research methods, namely:

- (a) the *type* of research question, such as “*who*,” “*what*,” “*what* (in terms of ‘*how many*’ and ‘*how much*’),” “*where*,” “*how*,” and “*why*,”

- (b) the extent of researcher's *control* over the actual behavioral phenomenon being investigated; and
- (c) the contemporariness (or historicalness) of the phenomenon.

(A). The type of research questions

As mentioned in Sections 4.2.1 and 4.2.2 above, the *nature* and *objective* of this research is to verify and evaluate the explanations and analytic generalizations of the O-O-P framework on the entrepreneurial phenomenon contextualized for the start-up situation. Such an evaluation requires a logical-positivist *line of inquiry* that asks the “*what*,” “*how*” and “*why*” questions regarding the entrepreneurial phenomenon in a contemporary, real-life context. The inquiry will entail investigating and collecting empirical evidence on *what* the ends-means relationships are among the variables. There is also the need to have a due process of interpretation or definition (Blumer, 1954), against which the O-O-P framework's explanations are evaluated to determine if they reify (Bryman & Bell, 2007) the social world, and the ontology and epistemology of opportunity. Additionally, the evaluation process must address *how* the core variables originate and inter-relate *causally* and *temporally* as part of the startup-venturing process, and *why* certain processes/activities are undertaken in a real-life start-up situation. There are analytical complexities because these factors of interest unfold over time (Bryman & Bell, 2007). Hence, “there will be many more variables of interest than (relevant) data points” (Yin, 1994, p. 13), which the *case study method* is better able to handle the overall exercise to evaluate the O-O-P framework as a single result of the inquiry.

(B). Contemporariness of actual behavioral phenomenon and extent of researcher's control

Case study is preferred for this research, as the objective is to investigate how startup venturing as a *contemporary* and *temporal* behavioral phenomenon “operates in a real-world environment in which decisions actually take place” (Shane, 2000, pp. 453, albeit his remark was in reference to the discovery of opportunity). Case study provides evidence in a situation where the

researcher *cannot manipulate*, and has *no control* over, all of the relevant behaviors in the start-up entrepreneurial process (Shane, 2000). Although the entrepreneurial phenomenon may have a historical dimension, the case study method is able to draw *primary* information that clarifies and more accurately contextualizes *contemporaneous* events by (a) interviewing the person who is involved, and/or (b) making direct observations (Yin, 2009). Case study is also much better equipped to deal with a full spectrum of evidence from a variety of sources – archival documents, artifacts, interviews, and observations.

4.2.6 Section summary

Although the case study method generally connotes an inductive relationship (flowing from research to theory) in the interpretivist framework, it is not necessarily associated with an inductive approach. Citing the work by Whittington (1989), Bryman and Bell (2007) concur that case study research can be used for theory *generation*, or theory *verification*. The latter is the purpose of this research.

Stake (1994) offers a different but refreshing perspective that can also be used to uphold case study as a method for this research, even though Yin (1994) considers the comment as too broad. According to Stake (1994):

“Case study is not a methodological choice, but a choice of object to be studied.” (p. 236)

As previously posed, the *unit of analysis* (or object of inquiry) of this *explanatory* research is a *startup-venture* undertaking entrepreneurial *process* that takes place *over time* to achieve certain *venture-outcome* for the particular *opportunity* that it has. Case study research is ideally *suited* to garner useful insights, and to *verify* the nature and functioning of the *how* and *why* of the temporal process relating to the startup-venture’s opportunity that the O-O-P framework seeks to *explain*. Case study is especially *appropriate* as compared to the other four qualitative research methods (namely, experiments, surveys, historical methods, and archival analysis) because it has the distinction of meeting *all* the three criteria that Yin (2009) highlights, namely:

- (a) the interrogative pronouns pertaining to the research questions of “*how*” (and also the associated “*what*” in terms of “what did you do?” as a precursor to asking the question regarding process like “*how* did you do it?”) and “*why*” are seeking *explanatory* answers;
- (b) the researcher has little or no control and manipulation ability; and
- (c) the focus is *not* on historical events but *contemporary*, real-life phenomenon instances (Yin, 2009).

4.3 Research design

4.3.1 Overview

Having thus elucidated the rationale for selecting *case study* as the *method* for this research, this section will explicate and describe its *research design*, which provides the blueprint for collecting, analyzing, and interpreting data (Bryman & Bell, 2007; Creswell, 2009). Yin (1994) defines research design more succinctly as the plan of sequential actions that logically links the empirical data or answers to be collected and analyzed, and the conclusions to be drawn, with the research’s initial questions. He advises that as an essential phase of research design, *theory* along with its *proposition/s* must be developed “prior to the conduct of data collection” (p. 27). The theoretical precedence applies regardless of whether the research is exploratory, descriptive, or explanatory (as in the context of this study). Theory plays a crucial role in (a) *designing* case studies, and (b) *generalizing* from them (Yin, 1994). The matter of generalization is dealt with in Section 4.4.2.

Theory development is the basis for generating the *research questions* that *guide* the *design* phase, whether the *ensuing* case study is conducted to develop or generalize the theory (Yin, 1994) by collecting, analyzing, and interpreting data. In the context of this study, the design of data collection and analysis processes of case studies undertaken by this research benefits from

the explanations on the start-up entrepreneurial phenomenon that is developed by the conceptual O-O-P framework. As explicated in the preceding chapters, the explanations of the O-O-P framework to be verified have been deducted from existing knowledge and available literature (Yin, 1994). They provide guidance for the design of the case studies and even for collecting the relevant field evidence for verification.

In summary therefore, research design pertains to the techniques that are used in the case studies to collect, analyze, and interpret field data that are *relevant* to the research questions (see Sections 1.3.2 and 1.3.3) which are identified from the O-O-P framework. The following section will discuss the common criteria used to assess the quality and trustworthiness of research design. The main techniques used for data collection in *fieldwork*, including case design and interview, are then outlined. This is followed by a discussion on the methods of data analysis, and the issues associated with the use of these methods. Issues like translation, transcription, and presentation arising from the fieldwork are also addressed. This chapter is summarized and then concluded.

4.3.2 Criteria for research design quality assessment and assurance

The quality and trustworthiness of a research along with its empirical findings need to be evaluated. There are no commonly agreed upon quality standards for case study research (Duxbury, 2012). Conventional positivist social scientists and rationalistic academics such as Eisenhardt (1989) and Yin (1994) respectively generally impose four criteria on disciplined inquiry and empirical social research (Guba & Lincoln, 1994; Yin, 1994), to enhance the quality of case study research. These criteria are rigorously followed herein to lay the groundwork for this research to be a high-quality study that Yin (1994) encourages. The criteria include the following:

- (a) Construct validity (sometimes also referred to as objectivity) looks at the extent to which the findings and conclusions are “free from bias” (Denzin & Lincoln, 1994b, p. 100). Bias can potentially arise from *subjective* measures used by the researcher to collect data. This is generally problematic for case study research, particularly those that are exploratory where theory generation follows empirical results. For

this reason, Yin (1994) proposes that researchers be the “distanced and neutral observers” (Guba & Lincoln, 1994, p. 114) during the data collection phase who identify and introduce correct *operational* measures for concepts under investigation (Yin, 1994).

This research has no difficulty in meeting the test of *construct validity* for several reasons. First, the O-O-P framework has been developed and operationalized. This avoids subjective interpretations, and ensures independence between the researcher and the startup-venture as the subject being inquired. As may be also noted from the preceding discussions, the O-O-P framework comes with an operationalized complement of definitions, dimensions, and orientations that *objectively informs* the research questions to investigate the entrepreneurial phenomenon, and determine the data type to be collected in a manner that reflects this research’s *logical-positivist* methodological paradigm. The *subjective* opinions or values of the researcher (even as the instrument of interview) are not involved or required. Thus, findings and results that emerge objectively from the data (rather from the researcher’s biases or values) can be compared to the conceptual framework serving as the benchmark.

Next, as will be explained, a multiple-holistic case study approach is employed in this research. It involves the gathering of *multiple sources of evidence* for cross-comparison, triangulation of data sources (see Section 4.4.5.3), and “converging [the] lines of inquiry” (Yin, 1994, p. 92). These actions mitigate the influence of researcher’s subjective biases and value from ladening the findings. Moreover, the researcher will carefully keep the data collected from the multiple-holistic case studies as a chain of evidence (including references/citations to the relevant portions of the case study document) so that third-party investigators and readers “can review [them] directly and draw their own independent conclusions” (Yin, 1994, pp. 95, 98). Thus throughout the *data collection phase*, the tactical employment by this research of operationalized concepts, multiple evidence sources,

and case documentation will enhance the *construct validity* as well as *reliability* of this research, and therefore its overall *quality* and *trustworthiness*.

- (b) Internal validity (which is more appropriate for *explanatory* or causal study such as this research³⁵) seeks to establish the extent to which the empirical findings “map the conceptual phenomenon in question” (Denzin & Lincoln, 1994b, p. 100). Guba and Lincoln (1994) describe internal validity as “isomorphism of findings with reality” (p. 114). Yin (1994) suggests that such determination can be done at the data analysis phase by matching patterns and/or building explanations on the *causal connections* among the antecedent and succedent variables.

Again, the O-O-P framework of this study provides the operationalized benchmarks for determining whether the empirical findings and patterns coincide with the phenomenon as explained. As we shall see in Section 5.5, the patterns do coincide. The empirical results of this research therefore support its *internal validity* claim, which is also strengthened by the literal and theoretical *replications* that assert its external validity (see the sub-paragraph below).

- (c) External validity, or applicability or “generalizability” (Guba & Lincoln, 1994, p. 114), is an integral part of the overall research design phase, and deals with the degree in which the research “findings can be generalized to other settings similar to the one in which the study occurred” (Denzin & Lincoln, 1994b, p. 100). Although it often is a shortcoming of single-case studies, *external validity* can be harnessed from the multiple-case study research approach adopted herein.

As we shall see in Section 5.5, this research is externally valid in terms of its analytic generalizations. Such validity is achieved herein by applying *replication logic* to the *multiple-holistic case research design* with the objective of achieving both *literal replication* (where the cases being investigated reveal similar results as

³⁵ i.e., as opposed to descriptive or exploratory studies, for which internal validity is not so appropriate.

predicted), and *theoretical replication* (where cross-cases reveal contrasting conditions).

- (d) Reliability, or “stability” (Guba & Lincoln, 1994, p. 114) refers to the repeatability, replicability, or reproducibility of a study’s results by another inquirer using well-documented data collection (Denzin & Lincoln, 1994b; Yin, 1994). This research achieves and reinforces reliability during the data collection phase by the proper case study protocols for the research.

4.4 Fieldwork overview

As Taylor and Bogdan (1998) observe, the qualitative researchers “go to the people” (p. 3) where the phenomena develop into what they are. Fieldwork is thus the primary instrument to observe and collect data. Another way of describing *data collection* for this research is as a *process* of *activities* (including case interviews and researcher’s observations) before, during, and after the fieldwork, designed to collect data. In this connection, it is the *research questions* as identified from the O-O-P framework that *inform* the *case studies* regarding (a) the appropriate *unit of analysis* (Yin, 1994), which is the startup-venture with its entrepreneur conducting/undertaking the entrepreneurial process for its opportunity, and (b) the *relevant data* to be collected. Each of these components is further discussed below in Sections 4.4.1 and 4.4.2, and also Section 4.4.5.2 respectively.

4.4.1 Unit of analysis

For the design of case study research to be operational and able to provide functional value in terms of getting the relevant data, a clear definition must be made on what a “case” (Yin, 1994, p. 21) or unit of analysis is. Yin (1994) clarifies that “the definition of the unit of analysis (and therefore of the case) is related to the way the initial research questions have been identified” (p. 22), and it “is likely to be at the level being addressed by the main study questions” (Yin, 2009, p. 31).

As already explained variously in Sections 4.2.1, 4.2.2, and 4.2.6, the unit of analysis herein refers to “a *startup-venture*” undertaking the entrepreneurial process over time to achieve certain *venture-outcome* for the *venture-opportunity* that it has. This definition “embodies” (Yin, 1994, p. 28) *what* the O-O-P framework articulates and explains concerning the start-up entrepreneurial phenomenon. It is functionally useful in keeping the research work focused, and acts as a “strong guidance” (Yin, 1994, p. 28) for determining where to obtain the empirical data.

4.4.2 Basis for case selection – Nature of cases

For case study research, a ‘case’ is chosen if it qualifies as a unit of analysis as defined above. Such a choice is primarily to illuminate the research questions, and to achieve *replication logic* rather than *sampling logic* (Eisenhardt, 1991; Yin, 2009).

For this research, a case selected for investigation can come from a broad range of industries that are *primarily high in technology* (or “**high-tech**”) where the Schumpeterian new combinations happen. This means that the startup-venture is operating in domains like biotechnology, chemical engineering, creative media, medical devices, software applications, web-based solutions, and so on. No particular type of domain is preferred over another.

The reason for targeting the high-tech industry as the source of research cases is because it typifies the environment in which startup-ventures operate. Generally, the environment is “high velocity” (Payne & Bettman, 2007), having pronounced levels of competition, and characterized by uncertainty and ambiguity. Remarkably, the incidence of start-up activities is found to be high in such an environment, requiring an increased role of entrepreneurship in response (Payne & Bettman, 2007).

For a startup-venture, the high velocity environment creates *time-pressure*, which oftentimes requires entrepreneurial decision-making not so much as to meet strict deadlines, but to avoid the potential opportunity cost of delaying decisions (Payne & Bettman, 2007). To deal with *rapid changes* in knowledge and creativity in the high-tech industry’s *competitive* environment, there is a corresponding need for startup-ventures to *innovate* and produce novel, cutting-edge content.

Innovation includes *adopting* and *implementing* useful and novel ideas (Van de Ven, 1986; Von Hippel, 1982) to allow firms to stay ahead of competitors. This explains the empirical findings by a number of past studies, which suggest that firms tend to be more innovative in highly competitive environments (Khan & Manopichetwattana, 1989; Sauitaris, 2002).

Selecting high-tech startup-ventures for case studies is therefore appropriate and meets the Schumpeterian (1934) qualities of firms that produce *innovative* ‘new combinations,’ and are truly ‘entrepreneurial’ in nature. They are cases pursuing innovative venture-opportunities that fit Quadrants II, III, and IV of the opportunity-hexadecadrant in Figure 3.6, unlike the discovery opportunities in Quadrant I (defined herein in the strictest form as relating to wholesale or retail trading activities) which Alfred Marshall (1920) describes but chooses to omit from his formal analysis of supply and demand³⁶.

Apart from the requirement of the cases being in the high-tech industry, this research need not involve itself with the sampling strategy that Miles and Huberman (1994) advocate in regard a proper selection of cases to represent some population in the attempt at *statistical generalization*. To reiterate, one of the purpose of this research is to achieve *analytic generalization* of the empirical findings from case studies to the *theoretical propositions* of the O-O-P framework, and “not to populations or universes” (Yin, 1994, p. 10). The research cases selected for investigation are therefore not sampling units.

4.4.3 Preferred approach: Multiple-*holistic* case study & justification

Earlier, it was mentioned that the O-O-P framework as developed constitutes the conceptual benchmark against which the empirical findings from case studies will be compared (Yin, 1994). Of interest to this research are the three opportunity-quadrants in the O-O-P framework, namely, Quadrants II (constructionist opportunity), III (creation opportunity), and IV (regression

³⁶ Quadrant I is excluded because it pertains to discovery opportunities in the retail and wholesale industries that are characteristically arbitraging activities and hence involve entrepreneurship levels that are considered ‘low’ in the view of Schumpeter (1934).

opportunity). This means that at least three *single* cases, one for each quadrant respectively, can be studied for which the following designs are possible:

- (a) the *critical* case that is used to confirm, challenge, or extend a “well-formulated theory” (Yin, 1994, p. 38) which has a specified set of explanations;
- (b) the rare, “extreme or unique case” (Yin, 1994, p. 39) that can be used to document and analyze its unique rarities;
- (c) the *revelatory* case that allows observation and analysis of a phenomenon hitherto “inaccessible to scientific investigation” (Yin, 1994, p. 40).

There are many examples of groundbreaking studies based on *single* cases (Duxbury, 2012). However, the drawback of single-case design is that the contemplated case may prove to be an inappropriate representation after all the work is done (Yin, 1994). Thus, from the perspective of this research, a *multiple-holistic*³⁷, *single unit of analysis* (hereinafter referred to as “multiple-holistic case study”), or what is called “Type 3” (Yin, 1994, p. 39) case study design, is the *preferred* strategy for this research (see Figure 4.1). The reason is that the evidence from multiple-holistic cases is frequently regarded as being more compelling, which thereby makes the overall investigation more robust (Herriott & Firestone, 1983)³⁸ for the development of a rich theory.

³⁷ Following the convention laid down by Yin (1994, pp. 39, Figure 2.4) on the basic types of designs for case studies, a ‘holistic, single unit of analysis’ case is where it is the only or ‘global’ unit of analysis in and of itself, as is the case of a startup-venture having a particular type of opportunity. Within the venture, there is no other subunit of opportunity.

³⁸ Cited in Yin (1994, p. 45).

Figure 4.1 – Basic types of designs for case studies³⁹

	Single-case designs	Multiple-case designs
Holistic (single unit of analysis)	TYPE 1 (single-holistic)	TYPE 3 (multiple-holistic)
Embedded (multiple units of analysis)	TYPE 2 (single-embedded)	TYPE 4 (multiple-embedded)

To recap, the purpose of this research is concerned with verifying the *causal* A-E-M relationship among the variables explained by the O-O-P framework, whereby the change in one variable “coincides with the variation in another variable” (Bryman & Bell, 2007, p. 731). Using multiple-holistic case study method in entrepreneurship studies, such as this research, offers numerous benefits like in-depth details, and *actionable* ideas for practicing entrepreneurs (Duxbury, 2012). They can reveal pertinent details on *what* the variables and relationships are, and *how* the causality links operate. As Huberman and Miles (1994) note, “Multiple cases permit a replication strategy” (1994, p. 441). In a sense, multiple cases can be considered as multiple experiments that follow “replication” logic to gather empirical data covering the O-O-P phenomenon of interest and its *context* for “*analytic generalizations*” to theory, rather than “*sampling*” logic to gain “*statistical generalizations*” (Yin, 1994, pp. 30, 45). In essence, multiple-holistic case study is what Stake (1994) would call:

³⁹ Based on Figure 2.4 of Yin (1994, p. 39).

“[C]ollective case study⁴⁰ . . . [where] individual cases in the collection may or may not be known in advance to manifest the common characteristic. They may be similar or dissimilar, redundancy and variety each having voice. They are chosen because it is believed that understanding them will lead to better understanding, perhaps better theorizing [and generalizing] about a still larger collection of cases.” (Stake, 1994, p. 237)

To elicit analytic generalizations, the *conceptualizations* of the O-O-P framework will be the template (Yin, 1994) against which the *empirical findings* from the multiple-holistic cases are compared to determine *whether* the start-up entrepreneurial phenomenon as explained does hold true under certain consistent and repetitive circumstances (Yin, 2009). If two or more cases are shown to replicate a direct result as explained by the O-O-P framework, then ***literal replication*** may be claimed and *analytic generalizations* drawn (Eisenhardt, 1991; Yin, 1994; Yin, 2009). Conversely, multiple-holistic cases that reveal *contrasting* conditions when the phenomenon does not happen as conceptualized would be *theoretical replications* (Yin, 1994). In both instances, the empirical findings from multiple-holistic studies would “extend external validity” (Huberman & Miles, 1994, p. 435), and provide analytic generalizations as opposed to “statistical generalizations” (Yin, 1994, p. 30) to the explanations of the O-O-P framework. This makes the conceptual O-O-P framework not just academic and theoretical, but practical as well (Yin, 1994), which is what Duxbury (2012) advocates.

4.4.4 Pre-fieldwork procedure

Giving due regard to the replication considerations above, cases are chosen to illuminate the research questions, and obtain empirical data to verify the analytical generalizations of the O-O-P framework’s theoretical explanations (Yin, 1994). There is need therefore to define the type and the number of case studies prior to the implementation of fieldwork proper so that the research can gain the best possible explanations of phenomenon (Stake, 1994).

⁴⁰ Stake (1994, p. 237) lists two other types of case study research – *intrinsic case study* and *instrumental case study*.

4.4.4.1 Steps in case selection – Type, number, replication logic

The *first step* in case-selection is to determine the type of case. A case will be chosen if it qualifies as a unit of analysis as defined. In other words, cases selected for this investigation are representative of the population of startup-ventures in the high-tech industry, each pursuing its opportunity. “Balance and variety are important.” (Stake, 1994, p. 244). Hence, no one type of high-tech domain will dominate the basket of selected multiple-holistic cases. The empirical findings will cover different high-tech domains, making them much more *generalizable analytically* to the theoretical propositions as explained by the conceptual O-O-P framework.

The *second step* in case-selection is to determine the number of cases. If the aim of this research had been to obtain *statistical* generalizations (to enumerate frequencies), as many cases as possible would be chosen to represent a population or universe of cases. This helps to gain *statistical sampling power* (Da Rin & Penas, 2007) to generalize a *single truth* or uncovering a single set of *cross-case* generalizable conclusions (Yin, 2009). However, this research is intended for *analytic* generalizations (see [Section 4.2.2](#)), which by nature require only small ‘sample sizes’ (albeit a misnomer for the purpose of this research) to generalize (not particularize) the findings analytically back to the theoretical propositions explained by the O-O-P framework (Yin, 1994).

In both instances, replication logic will guide the determination of the type and number of cases involved in the multiple-holistic case investigation as a *process* to achieve analytic generalizations. Specifically, the investigation *process* will *cease* when there are (a) sufficient cases to represent the three opportunity-quadrants⁴¹ of the O-O-P framework that are of interest to this research, and (b) provide the basis for (i) replicating the direct results as *predicted (literal replications)*, and (ii) presenting contrasting results (*theoretical replications*) (Yin, 1994).

According to Yin (1994), a research can settle for two or three *literal replications* as a standard when there are “grossly different rival theories” (p. 51). However, this standard does not apply to

⁴¹ Each opportunity-quadrant (constructionist, creation, and regression) visualizes different opportunity-types with either market- or product- ontological root-origins that predictably orientate the ends-means relationships, outcomes, and processes/activities.

the present study's O-O-P framework, which is unique and one of its kind. Even though it is generally deemed that five replications are appropriate, the researcher decided to “press for five, six, or more replications” (Yin, 1994, p. 51) in the interest of rigor and providing a high degree of certainty for the investigation.

As the case studies progressed during fieldwork, *literal replications* were consistently evident not only in cases that replicated the direct results, but also in cases that showed contrasting conditions for predicted reasons (theoretical replication). By the time the investigation covered 13 cases, the researcher had garnered sufficient evidences to show both *literal* and *theoretical replications*. In fact, the basket of thirteen cases presented four sets of replications that provide analytic generalizations back to the O-O-P framework as follows:

- (a) Eight of the thirteen cases confirmed the theoretical explanations for the startup-venturing phenomenon (the **venture-stayers**).
- (b) One case confirmed the explanations even though it *segmented* its market during the start-up process (the **venture-segmenter**).
- (c) Two cases confirmed the explanations even though they *streamlined* the instrumental-means to meet their respective opportunity's root-origins (the **venture-streamliners**).
- (d) Two cases showed deviant (subverted) conditions under which the startup-venturing phenomenon still holds, albeit for their respective subverted opportunities (the **venture-subverters**).

Collectively, the 13 cases double the minimum of five literal replications that Yin (1994) would consider as acceptable. As shall be detailed in Chapter 5, *theoretical replication* is also revealed across the four result-sets. Taken together, the number of replications—both literal and theoretical—provides this research with a “[convincing] empirical grounding” (Eisenhardt, 1989, p.545). Moreover, the 13 cases presented 13 initial opportunities, five of which morphed over the course of the startup-venturing process. Thus, there were 18 opportunities to examine for the 13 cases on the start-up entrepreneurial process phenomenon. These opportunities provided the

occasion to address the related topics such as the ontological nature of opportunity, the determination of venture-outcomes, and the orientation of the different opportunity formation and exploitation processes. The 13 cases in aggregate, including the five that morphed, delivered compelling empirical findings that are analytically generalizable to the explanations of the conceptual O-O-P framework, such as the causality connections, and orientations among the set of core antecedent and succedent variables.

A description of the 13 cases categorized into result-set is presented in Table 4.1 below.

Table 4.1 – Description of research participants

S/ N	Venture	New Zealand business industry codes [Short description]	Year started	Detailed description	Initial opportunity- subtype [after subversion ⁴²]	Initial opportunity- quadrant/cell [after subversion ⁴³]
1	AudioSvcCo	J551110 Film & video - Production. [Post- production audio company]	07 Jan 2015	The company provides post- production audio services to 3D computer graphics interface (CGI) films.	CO	II/2
2	BallLeagueCo	M700050 Software development - Service [Web-based portal for amateur basketball enthusiasts]	25 Sep 2013	The company provides a sports engagement platform that lets amateur basketball players relive their moments of glory, making them feel like total pros.	CrO	III/5
3	BuildMgCo	J542010 Computer software - Publishing [Software (building management)]	18 Mar 2005	The company provides solutions to aid participants in the construction industry to manage complex building processes better.	CO	II/2

⁴² “Subversion” refers to the situation where the entrepreneur switched the focus of the venturing process away from meeting the root-origin of the opportunity towards the instrumental-means instead.

⁴³ Ditto.

S/ N	Venture	New Zealand business industry codes [Short description]	Year started	Detailed description	Initial opportunity- subtype [after subversion ⁴²]	Initial opportunity- quadrant/cell [after subversion ⁴³
4	ExtractCo	– Biotechnology (bio-friendly agriculture chemicals)	9 May 1994	The company delivers high throughput screening of bioactives for use in (pesticides, herbicides, fertilizers, etc.) to improve agriculture yields in a bio-friendly way.	CrO [RO]	III/6 [IV/3]
5.	GutHealthCo	– Pharmaceutical (therapeutic food for gut health)	3 Aug 1998 (Phloe project: 2007)	Product has a unique triple action of enzymes, prebiotics, and fiber, which have been isolated entirely from New Zealand green kiwifruit. Bioactives from the triple ingredients helps the body to optimize bowel health.	CO [CrO]	II/2 [III/5]
6	LawDocCo	J542010 Computer - Software [Web-based portal for online document management & professional development.]	19 Aug 2013	Software provides a simple, web-based continuing professional development and legal document management.	RO [CrO]	IV/1 [III/5]
7	LoyaltyCo	M694040: Internet advertising - Service Services [Loyalty cards]	1 May 2011	The cross-retailer loyalty saver programs of the company allows consumers to earn and spend their loyalty points in any participating stores, without limiting them to the stores where their money was originally spent.	CO	II/2
8	MedScreenCo	Q851230 Medical service - specialist [Service (medical screening for insurance application)	12 Apr 2013	The company's online health screening tool helps individuals and health insurance applicants to take control of their health in an accessible, convenient, and secure way.	CO	II/2
9	PulseCo	– Medical device (non-intrusive pulse measurement)	8 Jul 2004	The company's technological device measures in a non-intrusive manner the parameters related to arterial stiffness and cardiac function.	CO [CrO]	II/2 [III/6]
10	SkinCo	– Pharmaceutical (topical cream	1 Mar 2011	The range of unique clinically trialed skin cream products are GMP manufactured using US	RO	IV/3

S/ N	Venture	New Zealand business industry codes [Short description]	Year started	Detailed description	Initial opportunity- subtype [after subversion ⁴²]	Initial opportunity- quadrant/cell [after subversion ⁴³]
		for skin ailments)		patent (pending) using natural ingredients to treat skin ailments (eczema, psoriasis, lupus, skin cancer, etc.)		
11	SoundCo	– Software (sound-mixing for post-production)	21 Jul 2003	The company's innovative solutions are designed to help audio professionals to complete post-production work for the film & media industry expediently.	CO [RO]	II/2 [IV/3]
12	SysIntegrateCo	– System integration (medical devices)	24 Jul 2006	The range of unique clinically trialed skin cream products are GMP manufactured using US patent (pending) using natural ingredients to treat skin ailments (eczema, psoriasis, lupus, skin cancer, etc.)	CO	III/6
13	WellnessCo	M696205 Business consultant – Service [Internet portal (health & wellness management)]	2013	The company helps employers improve staff productivity and reduce turnover by offering wellness programs to reduce absenteeism, presenteeism, work injuries.	CO [RO]	II/2 [IV/3]

4.4.4.2 Overview of the cases & accessibility

Other than the singular need for the selected case to be in the high-tech industry, there is no predetermined criterion for selection. Even so, the pre-fieldwork attempts by the researcher to enlist start-up entrepreneurs to participate had been quite challenging. As discussed in [Section 4.4.2](#), the issue of *time pressure* for many of the start-up entrepreneurs is very real. The opportunity cost of participating in this research was perceived by the prospects to be foregoing time that could be gainfully spent on other more pressing business issues.

Hence, the researcher has had to resort to acquiring referrals from his personal networks (friends, alumni, former colleagues, and so on) and the initial group of participants *per se*. Because of their introductions, the eventual group of participants was more amenable to grant researcher the

necessary access, and share their opinions and personal experiences. Nonetheless, there remained the issue of setting mutually agreeable date and time for interviews, which had to be subordinated to the ongoing business commitments of the participants. Hence, the entire process of acquiring participants and fixing appointments for interview stretched more than three months.

In general, the participating startup-ventures exhibited *diversity* in terms of their industry domains, and also the gender, experience, academic level, and age of their respective entrepreneurs. The diversity adds rigor to the analytic generalizations of this research. There were nine entrepreneurs representing the 13 start-up cases. Three of the individuals are serial entrepreneurs owning three ventures, two ventures and one venture respectively. The remaining six are nascent entrepreneurs owning a startup-venture each. Eight of the entrepreneurs are males, while the ninth is a female. All of them have at least a college diploma, with two of them holding doctorate degrees. Although not formally disclosed, the entrepreneurs aged between 22 and 70.

4.4.5 At-fieldwork procedure

Yin (1994) mentioned six main sources of data collection in qualitative case study. They are documentation, archival records, interviews, direct observation, participant-observation, and physical artifacts.

4.4.5.1 Multiple information sources and collection methods

Being a multiple-holistic case study research, the collection of primary data for each selected case is from face-to-face interview, supplemented by inspections of website information, observations gleaned from corporate presentations, and data collected from short questionnaire. The researcher made a deliberate effort to get as much information from different sources using different data collection methods. This aids *triangulation*, which is further explained in [Section 4.4.5.3](#) below. Accordingly, the transcribed data from formal interview is complemented by:

- (a) inspecting documents, such as company records, company websites, press archives, and public records;
- (b) taking notes on “informal conversations” (McVea, 2009, pp. 494-495);
- (c) recording the interview;
- (d) collecting, just prior to the interview proper, *general information* on a short list of administrative questions, which included:
 - (i) demographics of the founder-entrepreneur (e.g., name, contact details, age, position in the company, education level, work experience, reason for starting the company),
 - (ii) the company’s profile (e.g., business description, year founded/started, location)
 - (iii) the company’s objective for the business opportunity/idea at hand, in terms of the product and target market (i.e., *existing* or *new/unproven*);
- (e) information from corporate materials which were provided at the entrepreneur’s discretion (e.g., if the information is considered not to be ‘sensitive’ trade secrets);
- (f) observations made (e.g. of emotions) during the interview (Yin, 1994).

4.4.5.2 Primary information source: Interviews

The case interviews were audiotaped, and later transcribed for coding and analysis. In-depth interview is the most commonly used technique among qualitative researchers to gather *primary* information (Marshall & Rossman, 1995). It is appropriate for this study as it keeps the research within the context of the phenomenon under investigation and provides first-hand account on *causal* events. Interview is a vital source of rich descriptive *qualitative data* needed to answer

this study's research questions, understand the reasons underlying the phenomenon, thereby increasing the internal validity of theory (Eisenhardt, 1989).

(A). Key respondents

The founding entrepreneurs of the startup-ventures were the key informants for the case interviews. In their role as opportunity-adventurers, they are knowledgeable about the phenomenon being studied (Campbell, 1955). They provided key insights into events, as well as recollections of prior and contemporary situations along with the conditions or context under which they occurred (Yin, 1994). In this sense, case interview is much more accurate as an information source than histories and archival records. The latter relates to “the ‘dead past’ and therefore seldom have any contemporary sources of evidence, such as . . . interviews with key actors” (Yin, 1994, p. 92).

(B). Semi-structured, open-ended interviews

Interviews conducted comprised a mix of semi-structured and unstructured, open-ended inquiries. The questioning *style* is *informal*. In keeping with the methodological paradigms of this research, the *line* of inquiry is *dualistic* and *objectivistic* so that the researcher and the participant stay independent of each other (Guba & Lincoln, 1994).

The researcher has a non-value and non-theory laden list of topics or issues drawn from the *research questions*. It is regimentally adhered and served merely as an ***interview guide*** to focus the researcher on what the case study is about (Yin, 1994). The phrasing and sequencing of questions are *open-ended*, and can *vary* from interview to interview. The purpose is to try to “understand complex behavior without imposing any *a priori* categorization that may limit the field of inquiry” (Fontana & Frey, 1994, p. 366). Open-ended interview allows the participants to *talk aloud* freely, share their *factual experiences*, and express *opinions* about the phenomenon. It contrasts with the other two types of interviews, focused interviews and formal survey types of interview, which are leading and too structured respectively in their line of inquiry. In open-

ended interviews, the role of the participant is more like an “informant” (Yin, 1994, p. 84), and is consistent with the positivist nature of this research’s methodology. Spontaneous follow-on questions posed by the researcher to the participant’s *story-tell* are done for *clarification* and *confirmation* purposes, rather than to influence them reflexively⁴⁴ or be influenced by them (Guba & Lincoln, 1994). The question list also reminds the researcher of the *naïve realism* ontology of the research methodology, which is to verify the “way things are” (Guba & Lincoln, 1994, p. 109) and whether they *converge* with the phenomenon as explained by the O-O-P framework.

The *objectivist* convention that is used in this research to verify the O-O-P framework and its propositions therefore adds *rigor* to the case research process. It helps to overcome the concern of “equivocal evidence or biased views of the researcher influencing or controlling the direction of the findings and conclusions” (Yin, 1994, p. 9).

4.4.5.3 Data triangulation of multiple information sources

The researcher recognizes that interviews are not without shortcomings. They are “subject to the common problems of bias, poor recall, and poor or inaccurate articulation” (Yin, 1994, p. 85). To mitigate, the researcher *corroborates* the interview data with *multiple sources of information* using *different methods of data collection* and *different data types* as mentioned in Section 4.4.5.1 above that have been subjected to *methodological triangulation* and *data triangulation* respectively (Patton, 1987)⁴⁵.

On the one hand, triangulating *multiple data collection methods and different information types/sources* on the same phenomenon helps to detect discrepancies and contradictions. For instance, during the questionnaire session that was held prior to the start of the interview with SysIntegrateCo, the entrepreneur inadvertently claimed that he was taking the market to a

⁴⁴ Reflexivity happens when the informant gives the interviewer what he/she wants to hear.

⁴⁵ Cited in Yin (1994, p. 92).

product, which suggested a product-orientation. As the actual interview proceeded however, it was clear that his venture was market-oriented in nature. Stake (1994) says:

“[T]riangulation serves to clarify meaning by identifying different ways the phenomenon is being seen” (p. 241).

On the other hand, corroborating interview data with multiple information and data sources makes the research findings and conclusions from the case studies “much more convincing and accurate.” (Yin, 1994, p. 92).

4.4.5.4 Theoretical triangulation of perspectives on data

As mentioned in Paragraph (B) of Section 4.4.5.2 above, there is list of non-value and non-theory laden topics or issues that the researcher used as an interview guide. The list is part of the *interview protocol* designed to increase the reliability (Yin, 1994) of this multiple-holistic case study research. In essence, the list of topics is formulated into field questions with supplementary *side-notes* that are meant to remind the researcher regarding *what* information needs to be collected and *why* (Yin, 1994). The questions serve as *prompts* in the researcher’s objectivist line of inquiry during a case study interview; while the side-notes help the researcher mentally to *corroborate* the interview information being collected ‘real-time’ with the explanations of the O-O-P framework. In other words, the main purpose of these questions and the supplementary side-notes is to keep the researcher on track with regard to the objective of the case study even as the interview is ongoing and data is collected (Yin, 1994). Such a streamlining process facilitates ***theory triangulation***, which really is the use of the supplementary *side-notes* to provide multiple *perspectives* and *perceptions* to (a) interpret the data that is being collected, (b) clarify meaning, and (c) verify the reliability of an observation or interpretation (Johnson, 1997; Stake, 1994).

Therefore, the supplementary side-notes alongside the field questions enable the researcher to be adaptive with rigor (not rigidity), so that the questions that the researcher can “eventually aggregate to some significant inquiry about how and why the [phenomenon] works as it does”

(Yin, 1994, p. 57). Taken together, the coupling of *theoretical triangulation* and *data triangulation* (see [Section 4.4.5.3](#)) is essential to meet the expectations of rigor for this research (Duxbury, 2012).

4.4.5.5 Interview process

The interview process takes place in stages. It includes activities prior to and during the interview sessions.

(A). Before the interview

Prior to going out to the field:

- A telephone call is made to introduce the researcher and his topic to the prospective interviewee who is the founder-entrepreneur of the startup-venture.
- Upon the prospect's agreeing to participate, an email is sent with a Participant Information Sheet and Consent to Participate Form (see [Appendix A](#) and [Appendix B](#)).
- Once the interviewee returns the Consent Form duly signed and received via email, the researcher would call the interviewee to arrange a mutually convenient date for the interview. The date usually had to be re-scheduled several times, and often at the last minute, due to the interviewee's time-pressure. BuildMgCo and AudioSvcCo are prime examples of cases where multiple alterations were made before a final date could be fixed.
- The researcher would google the Internet for public documents, and search websites and companies register regarding the case (see [Section 4.4.5.1](#)) to corroborate and validate information gathered from the interviews.

(B). On the day of the interview

On the appointed date, the researcher would follow an interview protocol to ensure *reliability*, *rigor*, and *trustworthiness* for this research as a *process* on the one hand, and *richness*, *robustness* and *replication* of empirical *evidence* on the other. The interview for each case study in the field typically lasted an average of about 90 minutes each, which covered informal conversations to ‘break the ice,’ corporate presentations, short questionnaire, and the formal interview.

The following describes the standard protocol *prior to* the interview proper:

- Yin (1994) opines that “a valid and high-quality case study” can be done “without leaving the library and the telephone” (p. 11). Four of the interviews for this research were done over the telephone, as the founder-entrepreneurs were oftentimes travelling. Eight others were conducted in the participants’ business offices, while one was done in a café.
- Prior to the start of the interview proper, the researcher would refresh the participant’s memory by briefly explaining the background and purpose of this research. The researcher would emphasize the motivation for this research, which is to understand the start-up entrepreneurial phenomenon for the betterment of literature and practice.
- The researcher would assure participant of confidentiality on all information given, and that accepted principles of ethical and professional conduct would be followed including the restricted use of information gathered from the interview, and maintaining anonymity.
- An informal conversation would follow, to ‘break the ice’ and obtain general information on the case as mentioned in Section 4.4.5.1 (see also Appendix C).
- At the participant’s sole discretion, a corporate presentation might be given; failing which the researcher would endeavor to obtain a verbal overview on the business of the participant’s startup-venture. The information facilitates understanding of the technology and the technical jargons involved in the business, and made the subsequent interview session much more efficient by mitigating the need for researcher to interject and seek explanations on business technicalities.

- Once the pre-interview information was sufficiently collected (which generally lasted for about 10 minutes), the interview session would commence.
- During the interview sessions, the mood and affective components were *observed*.
- All the interviews were audiotaped, and later transcribed for subsequent analysis.

Typically, the researcher adopts a posture that is curious and facilitative (rather than, say, challenging and interrogative). As mentioned in Paragraph (B) of Section 4.4.5.2, the interviews were conducted in an as open-ended manner as possible to make the participants feel at ease and forget that they were involved in a research event (Taylor & Bogdan, 1998). The researcher would listen carefully to what the entrepreneurs say or do in their real-life contemporaneous settings. The participants would be encouraged to further explain and clarify their answers. As each interview progressed, the participants became the storytellers (Yin, 1994), which helped to make the information come ‘alive.’

(C). Interview guide

The interview guide (see Appendix D) acted only to remind the researcher of open-ended questions to ask and the researcher does not control or influence the sequence or content of the participants’ responses whatsoever. The purpose is to elicit, in an equally open-ended manner, the participants’ experiences, and the meanings they drew from their experiences. The interview guide comprised field questions and side-notes, the details and objectives of which are described below.

(1). Wording of field questions to avoid imposing “definitive” concepts

The researcher was cognizant of the need to *avoid* lading empirical facts with value and theory. In consequence, the researcher developed a set of field questions (**FQ** or **FQs** as the context deems fit, see Appendix D) that corresponded generally with the research questions (**RQ** or **RQs** as appropriate). However, the FQs were dialectically independent and sanitized of the academic vernaculars used in the latter. This mitigated, if not eliminated, the imposition of

“definitive” concepts on social studies such as this research, thereby removing possible criticisms such as Blumer’s (1954) that could arise (see sub-paragraph (c) of Section 4.2.4).

Thus on one hand, the FQs are made simple for the informant to understand. On the other hand, the FQs were supplemented with side-notes to keep the researcher *focused* on the pertinent *aspects* of the opportunity-adventuring phenomenon to which they relate. For example, where the researcher wanted to know about the *ontological nature* and *origin/source* of opportunity, the FQ would be framed as, “What triggered your business opportunity?” The supplementary side-note, “Was it a product or market idea?” would serve to remind the researcher of the ontological *context* (in terms of supply or demand) that the FQ was related to. The side-note would also prompt the researcher to seek *clarification* from the informant when the response was unclear, or where the researcher needed more explanation on specific aspects of interest. Hence, the FQs worked in tandem with the side-notes to manage the amount of collected data “within feasible limits” (Yin, 1994, p. 22).

Table 4.2 shows the list of FQs and supplementary side-notes that guided the researcher, and kept him focused on *what* relevant data to collect. As indicated in Column 1 of Table 4.2, the FQs covered the three major aspects of the startup-venturing phenomenon. They relate to the (a) ontological origin of opportunity (b) venture-outcome and orientation, and (c). epistemology of opportunity’s formation and exploitation.

Table 4.2 – Field questions in relation to the research questions

Column I	Column II	Column III	
Aspect of phenomenon	Field questions (“FQs”)	Corresponding research questions (“RQs”)	
A. Ontological nature of opportunity (root-origin, or triggering source of change)	FQ1. What triggered your business opportunity/idea? [S-N ⁴⁶ : Was it a product or market idea?]	RQ1. What is the ontological nature of entrepreneurial venture-opportunity?	RQ2. What are the different types of start-up entrepreneurial venture-opportunity?
	FQ2. How did you identify/discover the business opportunity/idea?		
B. Determination of venture-outcome and orientation	FQ3. What is/are the <u>outcome/s</u> you need for the business opportunity/idea?	RQ4. What are the relevant venture-outcomes for the various types of start-up entrepreneurial venture-opportunity?	
		RQ5. How are the venture-outcomes for the various types of start-up entrepreneurial venture-opportunity formed?	
		RQ6. How do the venture-outcomes get oriented and prioritized?	
C1. Epistemology of opportunity (formation & evaluation) and orientation	FQ4. What were the 1st things you did (or had to do) to form the business idea/opportunity? [S-N: How did you do them?]	RQ3. How are the various types of start-up entrepreneurial venture-opportunity formed and evaluated?	
	FQ5. How did you decide to pursue the business opportunity/idea?		
C2. Epistemology of opportunity (exploitation) and orientation	FQ6. How did you go about trying to achieve the outcome/s for the business opportunity/idea? [S-N: Some of the activities to cover would include product-related, and market-related activities]	RQ7. What are the actions and processes taken in connection with the respective venture-outcomes?	
		RQ8. How does the entrepreneurial process get oriented?	
D. Other thoughts	FQ7. What would you have done differently (if at all)?	RQ9. What are the factors that might moderate or change the venture-outcomes and the entrepreneurial process taken to achieve the venture-outcomes?	

(2). Encouraging “sensitizing” concepts and perspectives

Other than being dialectically different from the RQs to avoid imposing “definitive” concepts, the FQs also served the researcher’s objective of encouraging and uncovering “sensitizing” concepts and perspectives (Blumer, 1954) from the participants on the startup-venturing phenomenon. Sub-paragraph (c) of [Section 4.2.4](#) mentions this objective, which is embedded in

⁴⁶ “S-N” denotes “side-note/s.”

the mix of ‘*what*’ and ‘*how*’ interrogative pronouns present in the FQs (see Table 4.2). The following describes the manner and context in which the interrogative pronouns were used as part of this research’s “line of inquiry” (Yin, 1994, p. 9):

- (a) The “*what*” interrogative pronoun in FQ1 was used to illuminate the key *variable* that initiated an opportunity, whether product or market.
- (b) FQ2’s “*how*” interrogative pronoun helped to shed further contextual insight on FQ1 by inquiring into the ontological *root-origin* or *source* of opportunity, whether demand or supply (each of which can be either the instrumental-means or the root-origin), and whether it is existing or new. Depending on the answer, the ‘type’ of opportunity is determined.
- (c) In FQ3, the “*what*” interrogative pronoun inquired whether the *venture-outcome* for a particular opportunity was market- or product- oriented.
- (d) The “*what*” interrogative pronoun in FQ4 sought to reveal the *variables* involved in the *process* of forming an opportunity.
- (e) FQ5 with its “*how*” interrogative pronoun would be used whenever necessary to supplement FQ4 in seeking information on the formation of opportunity, which *process* also includes the decision made to proceed with starting up the venture.
- (f) FQ6’s “*how*” interrogative pronoun sought to understand opportunity exploitation as a *process*, and the market- and product- related activities that are involved. This helped to trace the “operational links” (Yin, 2009, p. 9) among the variables and their *orientations*.
- (g) The “*what*” interrogative pronoun in FQ7 sought to reveal reasons for deviations from *venture-outcome* and *process* that the startup-venture should have adopted.

True to the ‘spirit’ and meaning of sensitizing concepts, the FQs with their interrogative pronouns clearly lacked specifications of attributes or benchmarks (Blumer, 1954). They were

not ‘leading’ questions in the sense of suggesting certain kind of answers to the informants (Bryman & Bell, 2007). At the same time, the FQs were made as *open-ended* as possible, to the extent that the line of inquiry became almost unstructured.

This meant that the informants could freely express themselves and answer in the way they deemed most appropriate. The FQs gave the researcher “a very general sense of what to look for” (Bryman & Bell, 2007, p. 408), and served as a mechanism for uncovering a *variety* of *sensitizing* concepts (Blumer, 1954) and perspectives on the three aspects of opportunity-adventuring phenomenon. They helped to elucidate fine nuances in “forms that the concept can assume or the alternative ways of viewing the concept and its manifestation” (Bryman & Bell, 2007, p. 408).

(D). Conduct of the interview process

The FQ’s open-ended nature also signified other implications insofar as the interview process was concerned. First, the researcher did *not* need to ask *all* the field questions for every case interview. When an informant’s answer to a FQ fulfilled the information needs of another FQ, the latter would be skipped. Second, the sequence of asking the FQs can vary, depending on the answer provided to a FQ. Consequently, the *empirical* information and *sensitizing* concepts together with the attendant descriptions, and insights that emerged from case interviews based on non-definitive questions, can be *objectively* evaluated against concepts and explanations of the O-O-P framework which are “definitive” (Blumer, 1954, p. 7). This helps to fulfill the aim of this research, which is to verify the startup-venturing process as described and explained by the O-O-P framework.

4.5 Data transcription

The researcher personally transcribed the audiotaped recordings of all the 13 case interviews in their entirety. This was partly due to budget constraints; but the primary motivation was to use the transcription process as an opportunity to examine in detail what the participants said. The

transcriptions proved to be highly time-consuming and more challenging than anticipated. Each minute of conversation required about twenty minutes of transcription effort to reproduce the conversation into typewritten text. The complications came from spontaneous interjection of responses mid-way when questions are being asked, incoming phone calls, habitual repetitions of certain words or phrases (i.e., verbal ‘tics’), slurring of words, hesitations, difficulties in understanding the accent/intonations, pronunciation of words spoken, and background noises which distorted the words.

Nonetheless, standard conventions for transcribing the data from case interviews were followed – that is, every single interview was reproduced word for word in writing. Steps were also taken to listen and re-listen to the audiotaped interviews to minimize mistakes that might stem from mishearing, carelessness, and fatigue. Where conversations are inaudible, the relevant sections of the audiotape along with the transcribed texts would be sent to the participants for clarification.

4.6 Data analysis

The success of a qualitative research requires a rigorous data analysis (Miles & Huberman, 1994), defined as “the process of making sense out of one’s data” (Merriam, 1988). Yin (1994) operationalizes data analysis as a process that “consists of examining, categorizing, tabulating, or otherwise recombining the evidence, to address the initial propositions of a study” (p. 102). However, the strategies and techniques for data analysis in the domain of case study lack precise definition (Yin, 1994), posing a challenge to researchers. Analyzing and interpreting collected data therefore remains largely reliant on the case study researcher’s thinking style.

To deal with the challenge, Yin (1994) entreats researchers to apply “a general analytic strategy” (p. 103). This ensures that the empirical evidence is given fair treatment and without bias. It also facilitates compelling analytic conclusions to be drawn. Yin (1994) suggested two general analytic strategies for consideration, which is to (a) follow the theoretical propositions that inspired the study, and (b) develop a descriptive structure to organize the case study.

4.6.1 The logic used for data analysis and interpretation

Relying on theoretical propositions and explanations is the preferred general *analytic* strategy for this research. They are useful for “guiding the *analysis*” (Yin, 1994, pp. 104, italics added for emphasis) of the multiple-holistic case studies, in the same way as they guided the case study on intergovernmental relationships carried out by Yin (1980, pp. 595-618). In this regard, the propositions of the conceptual O-O-P framework that explain the start-up entrepreneurial phenomenon had emerged deductively from a thorough review of entrepreneurship literature. Therefore, the *purpose* of this research will be to ascertain if the case findings can be analytically generalized to the conceptual explanations regarding the *causal* relationships and orientations of the three variables (opportunity, outcome, and process). In other words, the O-O-P framework informs the *design* for this research and the set of *RQs* used to *guide* the data *collection* plan, which sought answers to the ‘what’ and ‘how’ questions covering the three major aspects of the start-up entrepreneurial phenomenon as shown in Column I of Table 4.2. Likewise, the same three major aspects of the startup-venturing phenomenon guided and prioritized the process of *analyzing* and *interpreting* the data collected from the case studies (Yin, 1994).

4.6.2 Approach to data analysis

Following the framework as Yin (1994) proposed, the *logic* for *data* analysis and interpretation in this research included “examining, categorizing, tabulating, or otherwise recombining the evidence” (p. 102) collected from fieldwork. The researcher, who personally conducted the face-to-face interviews, carried out data analysis and interpretation. However, a number of additional measures were taken to ensure the validity and reliability of the coding and classification procedures. Following Creswell’s (2009) suggestions, analyzing and interpreting the transcribed qualitative data involved a number of interactive steps.

4.6.2.1 Examining data

After writing up the collected information on each case, the researcher would read all the data to get a sense of the whole, and make notes in the margin of the text for each of the case interviews. The notes reflected “general thoughts about the data as they come to mind” (Creswell, 2009). For the researcher, this was a form of preliminary “within-case analysis” (Eisenhardt, 1989, p.533’s Table 1) for analyzing and sorting collected data. It helped to increase the researcher’s familiarity with the respective cases, and enhance the reliability of this multiple-holistic case study research.

4.6.2.2 Categorizing/tabulating the data

The next step was the coding process of bringing meaning to information by sorting the empirical data, and segmenting sentences (or paragraphs) into labelled categories (Creswell, 2009). Gauzente (1999) refers to this process as breaking data down into “component parts, which are given names” (p. 4).

For this research, the categories encompassed the three aspects of the startup-venturing phenomenon as given in Column II of Table 4.2. They provide the *structural context* for the FQs and side-notes, which corresponded to the RQs. *Within case*, categorization was *manually* done by the researcher and then transposed *by hand* to a categorization worksheet for aggregation with the other case informants’ data (Bryman & Bell, 2007). Within each category, *cases* with answers having similar meanings were grouped into clusters to allow evaluation of this research’s external validity – that is, its *replication* logic (both *literal* and *theoretical*) and therefore analytic generalizability (Riege, 2003; Yin, 2009).

The NVivoTM qualitative data analysis software was used for preliminary analysis of the 13 case interviews of this qualitative research, even though the number is less than the threshold of 20 interviews suggested by Auld, et al. (2007). NvivoTM is not perfect for the work because the answers to the open-ended and almost unstructured FQs were varied and given in the way the informants deemed most appropriate. The freedom of expressions reflected the principle of

encouraging a variety of sensitizing perspectives (see Paragraph (C)(2) of Section 4.4.5.5) which guided the line of inquiry. As a result, the vocabulary from the case interviews was rich and varied (Gauzente, 1999), emerging in the NVivoTM environment as fragmented textual materials, or bits and pieces of sorted coded segments, just as some scholars described (Auld, et al., 2007; Weaver & Atkinson, 1994). In addition, there were fine nuances in forms that concepts like ‘opportunity’ and ‘outcome’ can assume or be expressed in alternative ways, which made it difficult for NVivoTM to extract, code, and analyze with any precision, coherence, or in context. Hence, to present a holistic picture without losing context and the narrative flow of what was said (Coffey & Atkinson, 1996)⁴⁷, the researcher complemented the machine analysis of NVivoTM with hand coding to consolidate the fine nuances and all associated text references that were given in the same context. It gives the researcher a better sense of the cases in totality and in relation to each other, and “a better contextual understanding of the concepts or patterns that emerge from the data analysis” (Auld, et al., 2007, p. 47). This in turn facilitated a more accurate and complete interpretation of the empirical data.

4.7 Reporting

For multiple-holistic case study such as this research, Yin (1994) has this to say:

“[T]he individual case studies need not always be presented in the final manuscript. The individual cases, in a sense, serve only as the evidentiary base for the study and may be used solely in the cross-case analysis.” (p. 137)

Taking the cue from Yin (1994), the 13 cases interviewed for this research are not presented individually as a single-case study, but synthesized for cross-case analysis. In this connection, Yin (1994) offers six types of organizational structure for reporting purposes – “linear-analytic, comparative, chronological, theory-building, suspense, and unsequenced” (p. 135).

⁴⁷ Cited in Bryman and Bell (2007, p. 597).

For this research, the linear-analytic approach is chosen in part because it is “the standard approach for composing research reports” (Yin, 1994, p. 138). In particular, it suits the purpose of this case study research to investigate and *explain* in a scholarly manner the startup-venturing phenomenon across the 13 cases. It also addresses the confidentiality and anonymity concerns of the participants.

Even though there are no separate chapters devoted to each of the 13 cases individually, the linear-analytic approach entails organizing the data from all the cases into chapter-sections (Yin, 1994). As shall be seen in Chapter 5, the chapter-sections are based around the three aspects of the startup-venturing phenomenon indicated in Column 1 of Table 4.2. These same aspects, which guided the data collection and analysis throughout this study, also guide the reporting process.

For each of the aspect (and its subtopic), analysis is performed on relevant cross-case data, which along with appropriate examples drawn from relevant cases, is dispersed throughout each chapter-section (Yin, 1994).

“The [analyses and] examples are described in sufficient descriptive narrative so that readers can vicariously experience them.” (Stake, 1994, p. 243)

4.8 Chapter summary

This chapter presents the objectives of this research, and the research questions guiding its paradigm and positivist methodology for verifying the explanations of the conceptual O-O-P framework relating to the entrepreneurial phenomenon among high-tech startup-ventures. The rationale for choosing multiple-holistic case study as the research method is explained, with the processes of collecting, analyzing, and reporting the empirical data from semi-structured interviews elaborated.

Chapter 5 – FIELDWORK/CASE STUDIES

The main findings and results from each of the case studies are outlined under separate chapter-sections, which generally follow the field questions and in turn, the topics and issues covered by the research questions. In other words, no single case is featured on its own because its results would be dispersed throughout each chapter-section. This reporting format provides a deeper understanding of the topical issues being discussed, allowing readers a vicarious yet insightful experience of the phenomenon described. It also helps to preserve confidentiality of information and anonymity of the participants of the study.

The presentation of the chapter-sections is categorized around the three aspects of the startup-venturing phenomenon indicated in Column 1 of Table 4.2, i.e. the ontological nature of opportunity including the determination of venture-outcome and orientation, and the epistemology of opportunity formation and exploitation. The presentation generally follows the *sequence* (Yin, 1994) of the startup-venturing process as elucidated in the O-O-P framework. For each category, the meaning or significance of the *empirical* findings will be discussed, particularly how they *coincide* with the *conceptual* patterns and propositions, and strengthen the *internal validity* of the O-O-P framework.

The extent of *literal replication* of the cases will be discussed where identical results were obtained from the 13 multiple cases (Yin, 1994). Similarly, *theoretical replication* across cases will also be highlighted where identical results failed to occur in certain cases, due to different circumstances that nonetheless were predictable and explainable.

5.1 Overview

As mentioned in Section 4.4.4.1, the field research consisted of interviews with 13 startup-ventures in New Zealand. All of them operate in the high-tech industry, albeit with different specialization. The 13 ventures are founded by nine entrepreneurs possessing different backgrounds, having a wide range of experiences and perspectives (see Section 4.4.4.2). These

diversities add *rigor* to the *theoretical* sample of cases (Glaser & Strauss, 1967)⁴⁸, and enriches the *reliability* and *validity* of this research on the startup-venturing phenomenon.

5.2 Opportunity as nexus of demand and supply, and orientation of outcome

5.2.1 Empirical findings

All the 13 cases their ventures had unique opportunity-*prospects* when they first started (**initial opportunities**, or **opportunity-prospects**). For various reasons as we shall learn later, some of these morphed over the course of the start-up cycle from a particular type of opportunity to another type (**morphed opportunities**).

The opportunity-hexadecadrant in Figure 5.1 depicts the initial opportunities of the 13 start-up ventures. When they were asked to describe:

- (a) their business opportunities or business ideas; or
- (b) the trigger of their business opportunities; or
- (c) how their opportunities (or ideas) came about,

every one of them (without any exception) cognitively articulated the *root-origin* (the *cause*) of their respective opportunities by using semantics that are *synonymous* with either “the supply of product/solution” or “market demand/need.”

⁴⁸ Cited in Kohli and Jaworski (1990, p. 2).

Table 5.1 – Summary of responses on ontological nature of initial opportunity and outcome orientation of venture-outcome⁴⁹

	Root-origin	Instrumental-means	Venture-outcome & orientation
SECTION A – Quadrant II / Cell 2 (QII/C2) ⁵⁰ : Constructionist opportunity start-ups	<u>Existing</u> market/ demand	<u>New</u> product/supply	Bringing product to market
1. AudioSvcCo	[31-32] ⁵¹ we were headhunted [188-189] post-production is a real weakness in Chinese films.	[58] we're providing you know basic um . . . core production services [59] our <i>innovation</i> to the market is really some of the collaboration tools	[234-235] try and <i>keep the presence happening and the projects happening</i> till we start to get some signed deal
3. BuildMgCo	[36-37] none of them really have any . . . any good system for being able to work out what the building actually cost	[43] . . . There's got to be a better way than this [46] whether we could come up with a solution	[160-162, 178-179, 182] we <i>will start putting in other small builders</i> and . . . at some point enough where builders . . . will be able . . . to take it on . . . a big vision . . . trying to [bring this] service in the market
5. GutHealthCo	[10-11, 19] the original founder had developed first for a kiwi fruit drink that was used in hospital for constipation . . . targeting a consumer market	[17, 27-28] The product was not working . . . went back and I completely re-designed the kiwi fruit product . . . add some extra little bits into it	[11-13] created a freeze-dried form of that drink that he puts into capsule . . . that was basically <i>launched into the pharmacies as a constipation treatment product</i>
7. LoyaltyCo	[11] many small businesses they want many loyalty customers	[12] so I . . . I needed . . . I wanted a [loyalty] program which can suit those merchants	[207] . . . bring something which the market will like very much
8. MedScreenCo	[13-14] You're a doctor, the forms you'd actually being tagged to a laboratory to get the blood test done. And the insurance companies found that it's a big hassle for people to do that	[16-18] with Med Screen we can actually send out our nurses or our staff . . . to do that medical form	[43, 399-400] we've gone the low hanging fruits just the "insurance" market . . . they actually want it . . . the outcome therefore . . . is to bring that solution that satisfy the needs of the market.
9 PulseCo	[19-20] we initially wanted to go for was to measure cardiac output, so that's a <i>fairly well-known need</i> . . .	[24-25] we ended up knowing that our <i>[new] product could meet</i> that [perceived] market need	[41-42, 116] to develop this idea into something more useable . . . so at that point we were talking to other clinicians about the idea
10. SkinCo	[41-42] no cream out there that actually treats eczema, they just relieve the	[27-28] then I basically started designing the product to fit into that niche	[42] So this is about developing a product that actually treated eczema

⁴⁹ Words in square brackets indicate where the researcher has inserted a missing word or phrase. Some words or phrases (e.g., "you know," repetitions (e.g., "you . . . you"), and other inconsequential nuances of speech (e.g., "er," "um") have been deleted.

⁵⁰ "Q" refers to "Quadrant" and "C" refers to "Cell." Hence, "QII/C2" refers to "Quadrant II / Cell 2."

⁵¹ The numerals shown within the square brackets refer to the line number/s of the transcript for the respective case interviews.

	Root-origin	Instrumental-means	Venture-outcome & orientation
11. SoundCo	symptoms [10-11] I was the market you know. I was the person who was in need of the product. So it was totally a market need	[15-16] I was basically the customer, who is in need of it, couldn't find it so I had to make it	[27-28, 86] we didn't have the available software. So <i>something needed to be created . . . to bring the product to market</i>
13. WellnessCo	[29-30] I knew that the market existed because again . . . the friend who I was working with work for a corporate health company. So I knew that they had existing customers	[10, 218, 68] an online health and wellness portal for businesses . . . solved a very defined problem, for a very defined market . . . a nice to have product	[97-98, 218, 101-102] <i>to bring the product that um . . . this new market would want . . . [to] solve a very defined problem, for a very defined market . . . I'll bring out a product with . . . a lot of . . . very strong and powerful value propositions, and then try to push it into the market</i>
SECTION B – Quadrant III / Cell 5 (QIII/C5): Creation opportunity start-ups	<u>New market/demand</u>	<u>New product/supply</u>	Bringing product to market
2. BallLeagueCo	[15-18] there are hundreds of millions of basketball players, low-level basketball players who are . . . you know, who . . . who go and play basketball every week but they don't have anything to be able to relive those awesome moments [250-251] there isn't really an intersection of what we are doing that . . . that has been done before	[18-19] you know realizing that there was the problem and an unmet need to be able to re-experience those moments . . . [184-185] more interested in how can we provide something that players would subscribe to	[187-188] our end-goal has been about <i>understanding what that [market] might be . . .</i> [186-187] We wanted to get to the point where we had a compelling upsell opportunity to players
12. SysIntegrateCo	[13-14, 40] I was driven by my heart. My passion was to be involved in the <i>critical care medicine</i> come what may [40] . . . how to improve his [sick people's] situation	[22-23, 76-77, 45] I worked in the area that convergence of tech . . . technology and human physiology [76-77]. . . solving the problem of medical device integration, all that convergence side . . . [45] No, there weren't [any solution] really	[79-80] spot the opportunities in that niche and then <i>grow the right product around it</i>
SECTION C – Quadrant IV / Cell 1 (QIV/C1): Regression opportunity start-up	<u>New market/demand</u>	<u>Existing product/supply</u>	Bringing product to market
6. LawDocCo	[11] <i>saw an unfilled market need</i> [23-24] initially we spoke to lawyers and they said, "We've got an issue with document storage."	[12] we didn't have a product in mind [15] We actually went and spoke to approximately 100 different professionals [27-28] what we originally looked at was a Dropbox™ type of service for lawyers	[26-28] what we <i>originally looked at was a Dropbox™ type of service for lawyers. . . and we started down . . . started down that path</i>
SECTION D – Quadrant III / Cell 6 (QIII/C6): Creation	<u>New product/supply</u>	<u>New market/demand</u>	Bringing market to product

	Root-origin	Instrumental-means	Venture-outcome & orientation
opportunity start-up			
4. ExtractCo	<p>[12-15] And we were basically sitting there thinking we've had enough of working for the public government. We'd seen several products we had created basically destroyed in the public sector. And we started thinking how could we put our <i>skills</i> together to create a company where we could work as scientists but <i>create products and get money back to us</i>.</p> <p>[28-30] And so that's what we set up the three of us bring our unique skills together that will cover all the screening of New Zealand's compounds.</p>	<p>[71] We thought if we created (the product), the market will come . . .</p> <p>[61-62] <i>without really knowing</i> . . . whether or not there's a market need or how big the market is going to be</p> <p>[68] looking back we were so naïve. [Laughter]</p>	<p>[71] We thought if we created (the product), the market will come</p>

The summary of informants' responses in Table 5.1 indicates that the *initial* origin of opportunities for 12 of the venture cases was rooted in *demand* (i.e., bringing/pushing product to market), while one had *product/supply* as its opportunity's root-origin (i.e., bringing/pulling market to product). This is not surprising as the level of entrepreneurial effort associated with the former is intuitively easier. The following highlights other pertinent observations:

- (a) As shown in Section A of Table 5.1 above, the initial opportunities for nine venture cases (i.e., AudioSvcCo, BuildMgCo, GutHealthCo, LoyaltyCo, MedScreenCo, PulseCo, SkinCo, SoundCo, and WellnessCo) were triggered by *demand* for *new* products in *existing* markets where the start-ups operated. These are the *Cell 2* type of *constructionist* opportunities in *Quadrant II* of Figure 5.1's Hexadecadrant.
- (b) The initial opportunities for two of the venture cases (BallLeagueCo and SysIntegrateCo) had root-origins triggered by *demand* for *new* products in *new* market-settings. Grouped under Section B of Table 5.1, the opportunities of these ventures are *creation* in nature as characterized by *Cell 5* in *Quadrant III* of the Hexadecadrant in Figure 5.1.
- (c) The root-origin of the initial opportunity for one of the venture cases (LawDocCo) listed in Section C of Table 5.1 was triggered by what the entrepreneur initially

perceived to be *new demand* in the market for *existing* product. It is a *Cell 1* type of *regression* opportunity in *Quadrant IV* of the Hexadecadrant in Figure 5.1.

- (d) With regard the venture case (ExtractCo) shown in Section D of Table 5.1, its initial opportunity's root-origin was triggered by the entrepreneur wanting to *supply* a *new* product that needed to find a new and yet unknown market. Such an opportunity is characteristic of the *Cell 6* type of *creation* opportunities in *Quadrant III* of the Hexadecadrant in Figure 5.1.
- (e) As evident in Figure 5.1, there is at least one initial opportunity in each of the three quadrants (i.e., Quadrants II, III, and IV) that are of interest to this research.

5.2.2 Analysis – Literal replications

The case responses summarized in Table 5.1 yielded a number of very interesting insights. *First*, empirical results show that entrepreneurial venture-opportunities of this multiple case study research do in fact manifest themselves in a variety of “different ways” (Eckhardt & Shane, 2010, p. 54) and multiple forms (Alvarez & Barney, 2007; Sarasvathy, et al., 2010; Shane & Venkataraman, 2000). The sources of change for all the opportunities can be attributable to:

“... *changing circumstances, chaos, confusion, inconsistencies, lags or leads, knowledge and information gaps, and a variety of other vacuums in an industry or market.*”
(Timmons, 1999, p. 81)

AudioSvcCo's opportunity reflected the need in China to plug the *gaps* in the capabilities and knowhow of its existing post-production industry, while BuildMgCo's opportunity was to fill the *vacuum* in the existing market for building management solutions. Similar vacuums in the marketplace for constipation remedies, loyalty programs, non-invasive measurement of arterial stiffness in humans, eczema, automatic post-production solutions, staff wellness, game involvement, and document storage prompted the opportunities of GutHealthCo, LoyaltyCo, PulseCo, SkinCo, SoundCo, WellnessCo, BallLeagueCo, and LawDocCo respectively. MedscreenCo found the opportunity to resolve the paperwork *chaos* that plagued the medical

insurance market, whereas SysIntegrateCo's opportunity was to solve the emerging need to manage data *inconsistencies* and *information gaps* among disparate medical devices and systems in the market for critical medical care. In the case of ExtractCo, the opportunity was triggered by the motivation to supply high-throughput screening services for plant-based compounds to a market that was not defined.

Second, as the empirical findings in Table 5.1 of Section 5.2.1 reveal, the cognitive perceptions and articulations of startup-ventures in real life situations support and confirm the ontological yin-yang notion of opportunity posited by this study (see Section 3.5.2). Specifically, opportunity is perceived and articulated as a nexus comprising changes manifesting through the *dualistic* elements of *demand* and *supply* interacting with each as either root-*origin* or instrumental-*means*, and under disequilibrium conditions in the existing and/or new marketplaces.

For instance in Section A of Table 5.1, GutHealthCo's new chief executive explained:

"[T]he original founder had developed first for a kiwi fruit drink that was used in hospital for constipation targeting a consumer market." (GutHealthCo)

The product however was unable to deliver the physiological benefits as promised to consumers in the existing market. To rectify, the new chief executive introduced a *new* innovative *product* for the *existing market*, becoming the founder of the new initiative in the process. The development and supply of a *new* innovative product thus became the *instrumental-means* for meeting *existing* market *demand*, which was the root-origin of GutHealthCo's opportunity. This is characteristically the *Cell 2* type of constructionist opportunity in Quadrant II of the Hexadecadrant (see Figure 5.1 and Figure 3.11). The decision and action of GutHealthCo conform to Grégoire and Shepherd (2012)'s observation:

"[E]vidence from other studies suggest that when people are free to think of any potential market in which to apply new technologies, they not only rely on their prior knowledge of these markets (cf. Gruber et al., MS2008, OS2012; Shane, OS2000), but also use this knowledge to zero in on key structure-level connections between the capabilities of new technologies and the root causes of particular market problems they

know about (cf. Grégoire, Barr, & Shepherd, OS2010). ” (pp. 777, underlined words are italicized in original text)

In comparison, it was the desire of its founding entrepreneur and her two co-founders to innovate and create new products that triggered the initial root-origin of ExtractCo’s initial opportunity.

“[W]ithout really knowing whether or not there’s a market need or how big the market is going to be.” (ExtractCo)

This supply-side root-origin was a kneejerk aftermath to the founders’ decision to resign from the research facility where they worked as they could no longer tolerate the bureaucratic process inefficiencies, or what Drucker (1985b) would call endogenous ‘incongruities’ (see Paragraph (B) of Section 3.5.2.3), at their workplace. Nonetheless as the founder admitted, they were naïve in thinking that if they created the product-supply, the market (which is the instrumental-means) “would come” to buy it.

Besides these two case examples, the other 11 interviewed cases also characterized opportunity implicitly and explicitly as a nexus with demand and supply interacting as either the root-origin or the instrumental-means.

The *third* insight is that the case interviews confirm the O-O-P’s notion of the opportunity’s root-origin as the orientator of the venture-outcome, which is *ipso facto* the fulfillment of the root-origin itself. Thus for ExtractCo which had *product/supply* as its opportunity’s root-origin, it focused on creating/building the product as its single most important *product-oriented venture-outcome*. Similarly, aside from ExtractCo, the other 12 cases with *demand* as their opportunities’ root-origin were focused on meeting the needs of customer demand in their respective marketplaces as their *market-oriented venture-outcomes*. Being *market-oriented*, the venture-outcomes of these 12 startup-ventures necessitated *market-driven processes*. They include the following:

- (a) First, *finding* the markets or niches where demand already exists (e.g., AudioSvcCo, BuildMgCo, GutHealthCo, LoyaltyCo, MedScreenCo, PulseCo, SkinCo, SoundCo, WellnessCo), or is emerging (e.g., BallLeagueCo, LawDocCo, SysIntegrateCo).

- (b) Next, *growing, developing*, or even *creating* the right product that the market might want (e.g., AudioSvcCo, BallLeagueCo, BuildMgCo, GutHealthCo, LawDocCo, LoyaltyCo, MedScreenCo, PulseCo, SkinCo, SoundCo, SysIntegrateCo, WellnessCo).
- (c) Then, selling directly (e.g., AudioSvcCo, BallLeagueCo, BuildMgCo, LawDocCo, MedScreenCo, PulseCo, SoundCo, SysIntegrateCo, WellnessCo), or through sales channels (GutHealthCo, SkinCo, LoyaltyCo).

All the 13 cases therefore provide literal replications that demonstrate the internal validity of the O-O-P framework's explanations regarding the core variables and their causal connections. When articulating cognitively and conducting the functional activities, the startup-ventures do regard opportunity as a dualistic nexus of demand and supply. The entrepreneurs interact with their respective 'type' of opportunities present or emerging in their marketplaces to form venture-opportunities as subsets. They then target market niches or segments where they operate (constructionist, creation, or regression shown in Figure 5.1). The findings also confirm the root-origin as the orientator of the venture-opportunity and its associated venture-outcome, either MdO or PsO, which then drives the entrepreneurial go-to-market process.

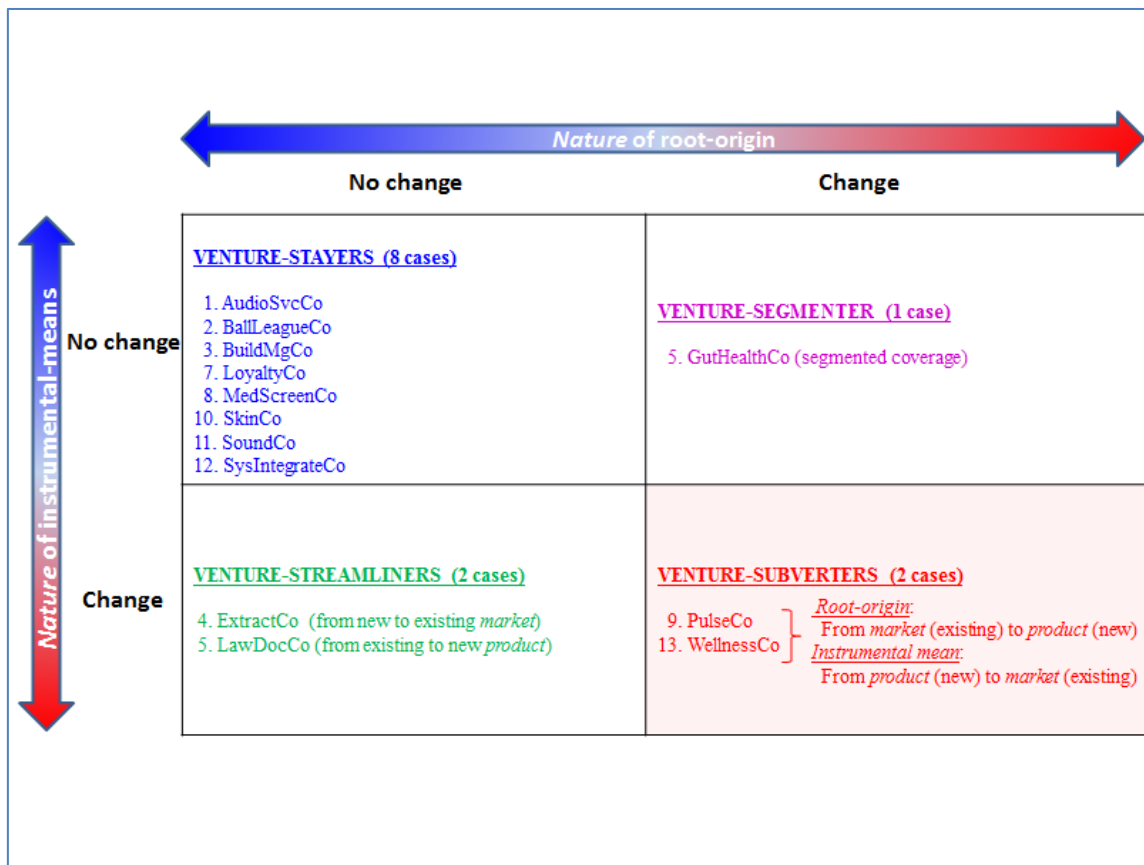
5.2.3 Theoretical replications - Four distinguishable categories of venture cases

Empirical findings showed that for some of the 13 cases, the ontology of their *initial* opportunities underwent changes/metamorphoses (yin-yang's tenet of dynamic duality) during the opportunity-adventuring process. Over a continuum, the ontology either did not change (for eight of the cases), or it metamorphosed in varying degree (for the other five cases) from partial to total change.

Figure 5.2 shows the ontologies (in terms of the *nature* root-origins, and/or the *nature* of instrumental-means taken for the respective opportunities), and changes thereto where applicable, for the 13 venture cases. As evident, they can be grouped into four categories – venture-stayers, venture-segmenter, venture-streamliners, and venture-subverters. Having five venture cases with

morphed opportunities dispersed in three of the four categories provide rigor to, and the bases for, this research to assert literal replications and theoretical replications that are analytically generalizable to the notions of the conceptual O-O-P framework.

Figure 5.2 – Mapping of morphed opportunities (where applicable) and the associated venture cases

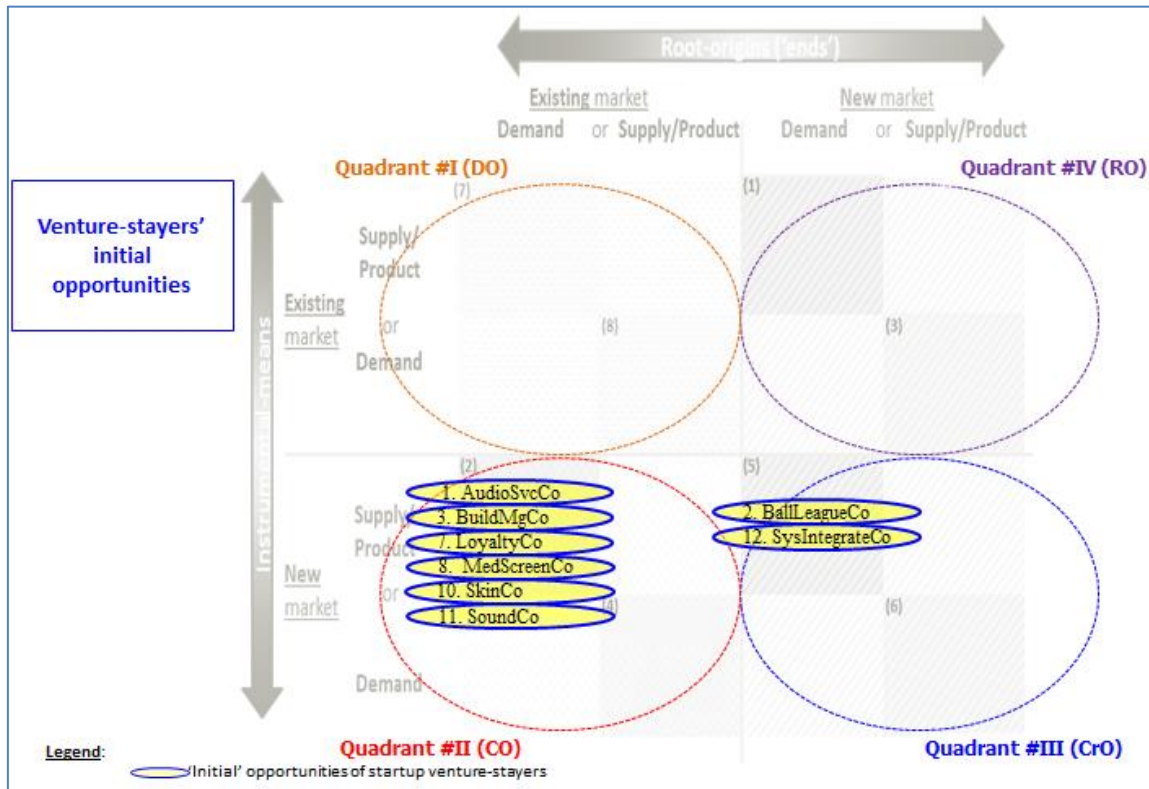


5.2.3.1 Venture-stayers

In eight of the 13 venture cases (shown in the top left-hand quadrant of Figure 5.2), the nature of dualistic demand and supply elements that comprised their respective venture-opportunity nexuses stayed unchanged throughout the start-up stage of their new venture. In other words, there were no changes in both the root-origins and the instrumental-means for the respective opportunities. These eight ventures (**venture-stayers**) include AudioSvcCo, BuildMgCo, GutHealthCo, LoyaltyCo, MedScreenCo, SkinCo, BallLeagueCo, SoundCo, and SysIntegrateCo.

The initial opportunities of the venture-stayers as represented by the blue-lined oval circles in Figure 5.1 are reproduced in Figure 5.3 below, with six falling within the constructionist Quadrant II and two in creation Quadrant III.

Figure 5.3 – Venture-stayers’ opportunities (initial, without morphing)



Being the unchanged *initial* opportunities as they are, the same analysis detailed in [Section 5.2.2](#) can also be used to reinforce the O-O-P framework’s explanation of opportunities as nexuses of demand and supply, with venture-outcomes that are defined and oriented by the root-origins.

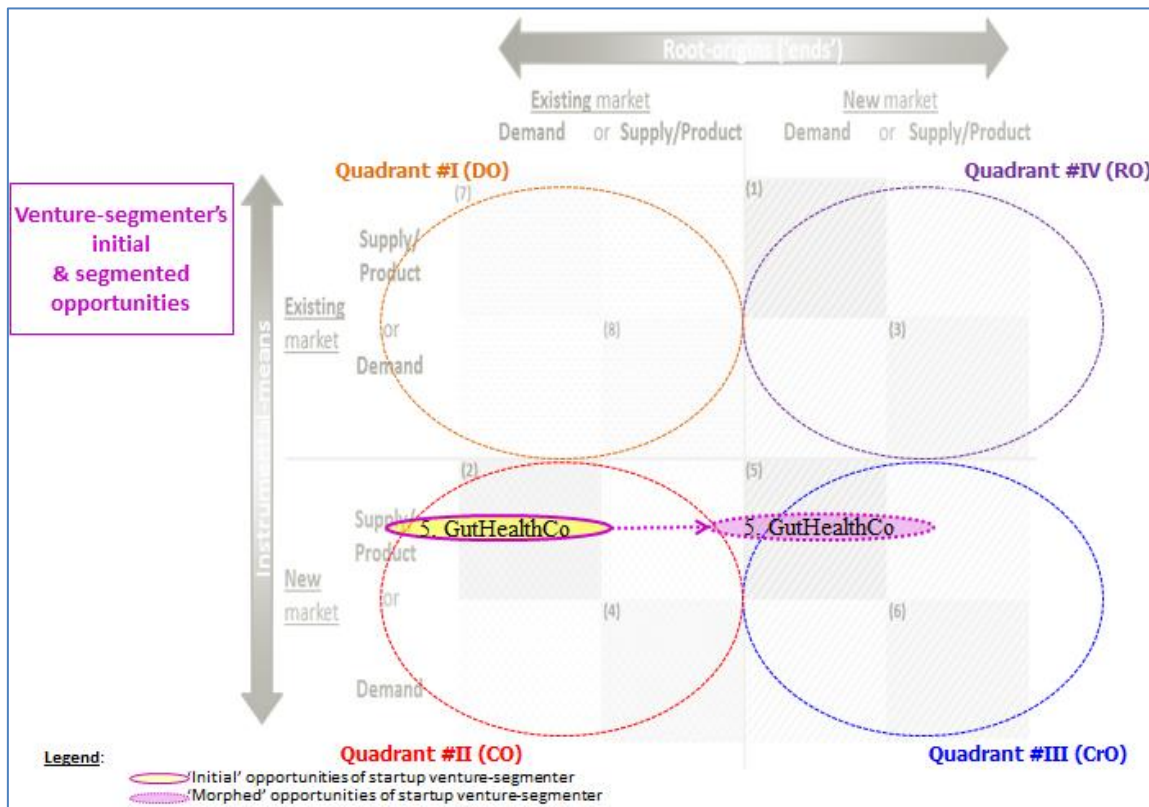
5.2.3.1 Venture-segmenter & market-segmentation

(A). How ‘segmented’ opportunity happen

One of the venture cases, GutHealthCo (which is shown in the top right-hand quadrant of Figure 5.2), is a “**venture-segmenter**” in the sense that its initial MdO constructionist opportunity (see

Cell 2 of constructionist Quadrant II of Figure 5.4) was to bring the instrumental-means of a re-designed kiwi fruit product as a new product-solution to the existing market.

Figure 5.4 – Venture-segmenter's initial and segmented opportunity



Its initial mission was to fulfill the general demand for constipation treatment in the existing market (the root-origin) as the MdO venture-outcome. However, it then decided to bring a new product that was needed by the niche market-segment for irritable bowel syndrome (IBS).

In the context of the hexadecadrant, its ontological nature is transformed or morphed from an MdO constructionist opportunity into an MdO creation opportunity (see *Cell 5* of Quadrant II of Figure 5.4). Nevertheless, the MdO of its root-origin remained unchanged in terms of its market orientation (see the second column in Table 5.2). The venture-outcome likewise remained MdO, which was “to make [the new product] in a very nice format *for people*” and bring it as the instrumental-means.

Table 5.2 – Venture-segmenter and its segmented venture-opportunity

	Root-origin	Instrumental-means	Venture-outcome & orientation
<u>QUADRANT III / Cell 5 (QIII/C5): Segmented creation opportunity</u>	<u>New market/demand</u>	<u>New product/supply</u>	Bringing <u>product</u> to market
5. GutHealthCo, from QII/C2 to QIII/C5	<p>Root-origin <i>remained</i> market-related but <i>morphed</i> from existing to <u>new</u> market:</p> <p>[33-37] then I also worked out that we needed to be targeting IBS [irritable bowel syndrome], that's the pure constipation . . . instead of trying to um . . . join all the other constipation products, we actually <u>created a new category</u> which became like the digestive health category, and we have basically grown the gastro-intestinal category in all the pharmacies . . .</p> <p>[39] So we don't compete with all the other product – we grew the category. . .</p> <p>[204] market segment which is IBS</p>	<p>Instrumental-means <i>unchanged</i>, and <i>remained</i> market-oriented – Bring <u>new</u> product as instrumental-means to a <u>new</u> (instead of existing) market:</p> <p>[47] so nobody else had tried to do kiwi fruit like that . . .</p> <p>[49] it helps constipation</p>	<p><u>Unchanged</u> – Market-oriented outcome of <u>bringing new product to new market</u>:</p> <p>[30-32:] Well I designed it so would um . . . not cause cramping, and bloating and er . . . flatulence, and all those other embarrassing things that the other products did. I <u>may also work out how</u> to make it in a very nice format <i>for people</i>.</p> <p>[89-90] targeted different aspects on um . . . how this kiwi fruit might work in the er . . . gut system</p>

Demand continued to be the root-origin, albeit as a new segment of the market, demonstrating the dynamic duality nature (temporal, evolving, malleable, multiple, and divisible) of the market-opportunity as segmentable into venture-opportunities by entrepreneurs.

“So we basically instead of trying to join all the other constipation products, we actually created a new category which became like the digestive health category . . . And we are now number one.” (GutHealthCo)

(B). Market-segmentation as a venture-opportunity segmentation strategy

GutHealthCo illustrates on how the market coverage of an opportunity can be *segmented* and carved out as a new niche from the wider existing market. Such *segmenting* of market coverage can be done without altering the ontological *nature* of the venture-opportunity's root-origin or

the orientation of the instrumental-means and venture-outcome that is needed to accomplish the venture-opportunity as a *segmented* market-opportunity.

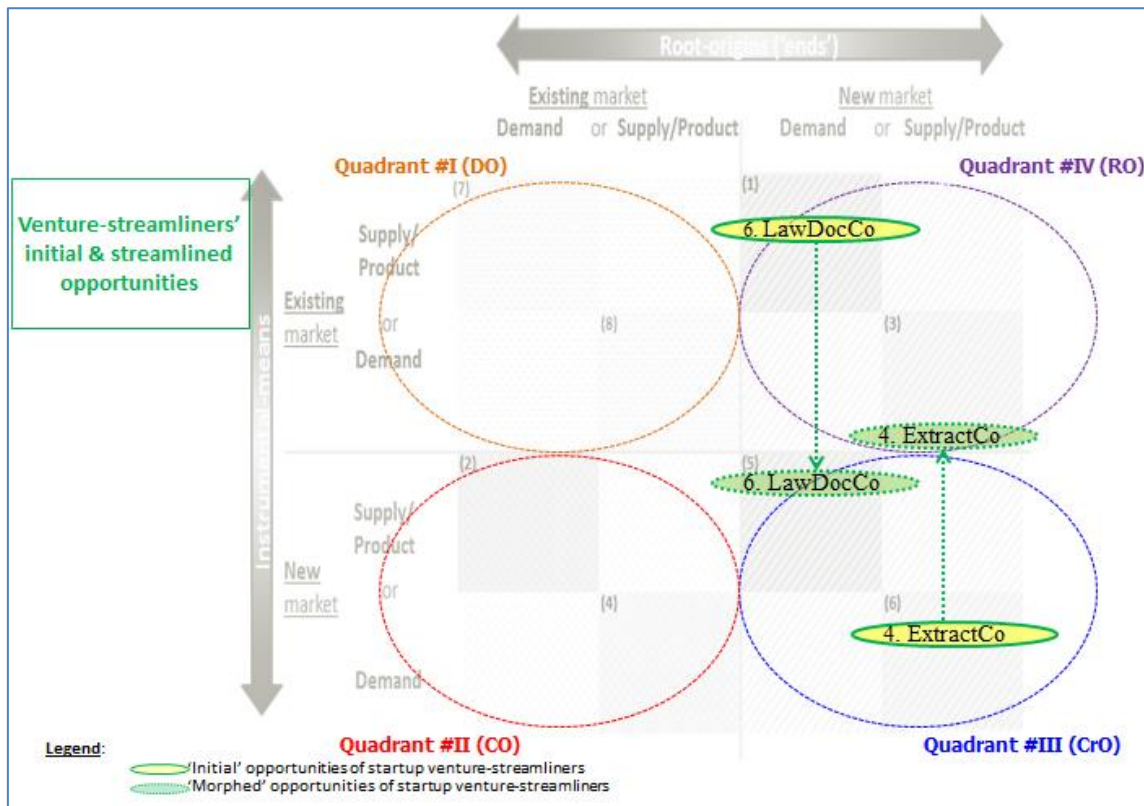
5.2.3.2 Venture-streamliners & streamlining of instrumental-means

(A). How ‘streamlined’ opportunity happen

Two venture cases, ExtractCo and LawDocCo (collectively “**venture-streamliners**,” as shown in the bottom left-hand quadrant of Figure 5.2) kept the *nature* of their venture-opportunities’ root-origins in their *initial* forms (i.e., *new* product-supply and *new* market-demand respectively). However, they streamlined the nature of the instrumental-means taken for their startup-venturing process.

For ExtractCo, streamlining the instrumental-means involved bringing *existing* (rather than *new*) market demand to the innovative new product it planned to supply for its PsO venture-opportunity, which nature was *initially* creation. In LawDocCo’s case, the instrumental-means was duly streamlined to bring a *new* (instead of *existing*) product-solution to a *new* market for its MdO venture-opportunity, which was *initially* regression in nature. Such streamlining/fashioning of instrumental-means altered the *ontological nature* of their respective *initial* venture-opportunities. The opportunities in their initial and streamlined states are represented by Figure 5.1’s oval circles outlined in green-colored unbroken and dotted lines respectively, and reproduced in Figure 5.5 below.

Figure 5.5 – Venture-streamliners' initial & streamlined opportunities



The explanations provided by the venture-streamliners on how they streamlined their respective venture-opportunities are summarized in Table 5.3.

Table 5.3 – Venture-streamliners and their streamlined venture-opportunities

	Root-origin	Instrumental-means	Venture-outcome & orientation
SECTION A – <u>QUADRANT III / Cell 5</u> (QIII/C5): <i>Streamlined</i> creation opportunity	<u>New</u> market/ demand	<u>New</u> product/supply	Bringing product to market
6. LawDocCo, from QIV/C1 to QIII/C5	Root-origin <i>unchanged</i> and remained <u>new</u> market-related: [37-41] we’ve got these <i>new</i> professional development rules coming into place um . . . from the 1 st of October last year.” And they said, “Look, we’ve got 100s of different lawyers, um . . . but no smart efficient way of tracking who’s done what, how many hours they’ve done, etc. It will be great if you can build us a product that helps . . . helps us track that.”	Instrumental-means <i>remained</i> market-oriented but <i>morphed</i> – Bring <u>new</u> (instead of existing) product as instrumental-means to <u>new</u> market: [43-45] So what we did is we then took that idea, and we went and spoke to whole lot of other firms and said, “Look, if we build something like this, would that be something that you’d . . . you’d buy?” And there a resounding “yes” across the board. Hence why we. . . we <i>headed in that direction</i> .	<i>Unchanged</i> – Market-oriented outcome of <i>bringing new product to existing market</i> : [47] So it was very much driven by the demand of the market rather than product first . . . [130-131] product development had to be related back into what the customers want
SECTION B – <u>QUADRANT IV / Cell 3</u> (QIV/C3): <i>Streamlined</i> regression opportunity	<u>New</u> product/supply	<u>Existing</u> market demand	Bringing market to product
4. ExtractCo, from QIII/C6 to QIV/C3	Root-origin <i>unchanged</i> and remained <u>new</u> product-related: [27-28] we thought there’s all these compounds out there that if we screen for them we could find them [78] . . . using our science to create something that they <u>would</u> want	Instrumental-means <i>remained</i> product-oriented but <i>morphed</i> – Bring <u>existing</u> (instead of new) market as instrumental-means to <u>new</u> product: [25-27] we suddenly thought we can actually target medical conditions, herbicides, pesticides, fungicides um . . . also kill off microbes . . . [37-38] the plan was to screen these extracts, make the extracts, and then sell them to the big companies [28] . . . and then basically sell these to companies like [a global agribusiness] ⁵² , [another agribusiness company], etc. [92-94] We went to that conference, we had no money, and we basically	<i>Unchanged</i> – Product-oriented outcome of <i>bringing existing market to new product</i> : [158-161] we had negotiated that from each extract we will get the royalty back cos we’ll find the extracts, show what kind of . . . what efficacy they had, and then [a global agribusiness company] will do the field trials, and when they launch the u, . . . genetic engineered crops etc., we will get the royalty back. [179-181] looking at the monetary incentives of er . . . <u>contracts</u> , . . . and er . . . [also] what <u>other possible clients</u> er . . . other than [a global agribusiness company] um . . . that can <u>sustain</u> [our] service provision business

⁵² Name withheld to preserve anonymity.

	Root-origin	Instrumental-means	Venture-outcome & orientation
		faked that we had it all in place. We had part of it in place but we basically bluffed our way to [a global agribusiness company], and they offered us a contract and that's how we . . . so the contract shaped what we did next	

Like Table 5.1, the responses in Table 5.3 are also categorically arranged by their ontological root-origins, which are market-demand or product-supply. The initial root-origin of LawDocCo's MdO regression venture-opportunity in Cell 1 of Quadrant IV (see Figure 5.5) was triggered by *new* market demand. The company initially sought to bring an *existing* and readily available product solution in the market, Dropbox™ as the instrumental-means to meet the new and “unfilled market need.” However, its prospective customers then advised that their immediate need was really to comply with “*new* professional development rules coming into place.” Therefore, the company refocused on building a solution to track staff development, and bringing it as the *new* instrumental-means to meet the new demand as the MdO venture-outcome.

“Product development had to be related back into what the customers want.”
(LawDocCo)

The venture-outcome remained MdO, and was still “very much driven by the demand of the [new] market,” which is the root-origin of its initial opportunity. Thus, despite the streamlining or fashioning of a *new* instrumental-means, which decidedly changed the ontological nature of the opportunity from being an MdO regression opportunity (Cell 1 of Quadrant IV) to an MdO creation opportunity (as represented by the Cell 5 of Quadrant III in Figure 5.5).

For ExtractCo, the root-origin of its PsO creation opportunity was inaugurated on the supply-side in Cell 6 of Quadrant III by the entrepreneur and her partners desiring to *create* and monetize new *products* without beholding the market for their *new* products.

“[W]ithout really knowing whether or not there's a market need or how big the market is going to be, [w]e thought if we created [the product], the market will come.” (ExtractCo)

Nonetheless, the promoters *then* thought that they could target their products for medical conditions, herbicides, pesticides, and fungicides. These conditions were already prevailing in the *existing* marketplace. Existing demand *thus* became the instrumental-means they tried to bring to their new products as a PsO venture-outcome. The ontological nature was therefore streamlined from being initially a PsO creation opportunity as represented by Cell 6 of Quadrant III, to become a PsO regression opportunity per Cell 3 of Quadrant VI in Figure 5.5. To bring the existing market to its new product, the promoters attended conferences and faked that they “had the product all in place” when in fact they did not.

“[W]e basically bluffed our way to [a global agribusiness company] and they offered us a contract and . . . shaped what we did next.” (ExtractCo)

ExtractCo also went about developing a prospective list of other possible clients at the same time. The venture-outcome thus continued to orientate around the new product-supply, which was the triggering root-origin of its initial PsO opportunity.

(B). Streamlining of instrumental-means

Both LawDocCo and ExtractCo demonstrated the operational flexibility and discretion that entrepreneurs could exercise in the nexus process of interacting with opportunity by streamlining the instrumental-means (yin-yang tenets of dynamic and dialectical duality). Even after streamlining, the orientation of instrumental-means to fulfill their respective venture-outcomes (the triggering root-origins underlying their respective initial opportunities) remains unchanged.

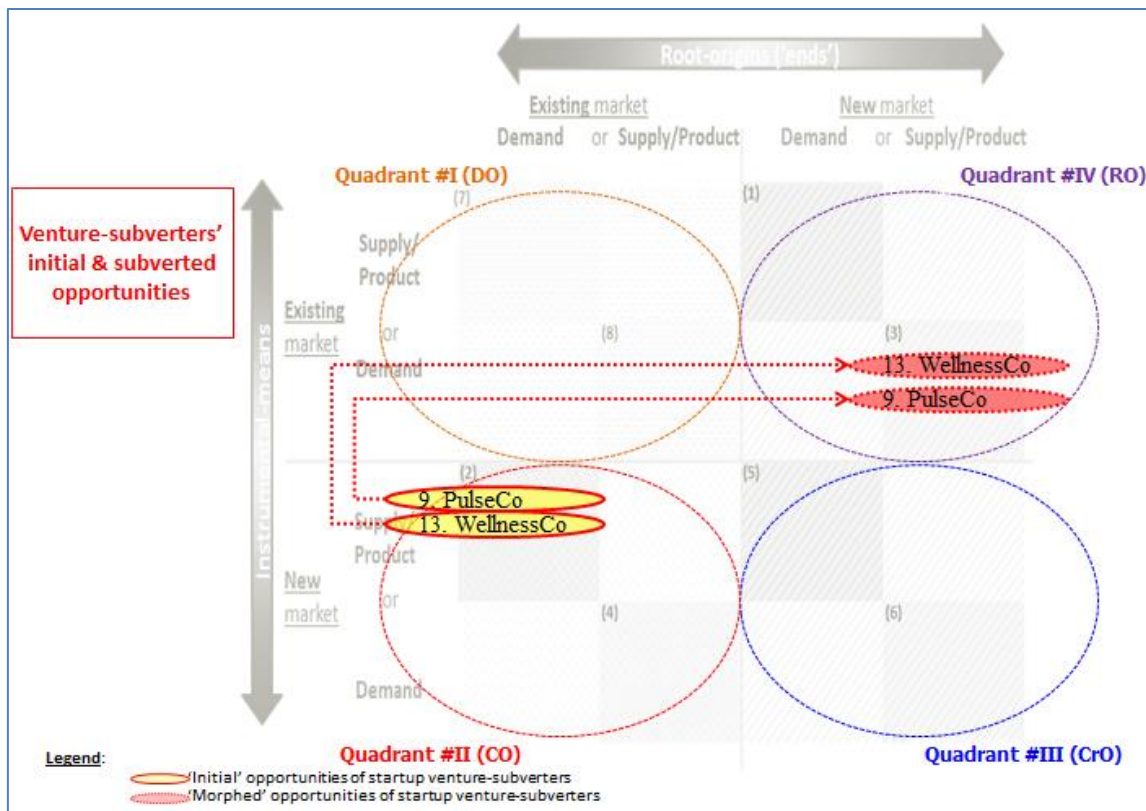
5.2.3.3 Venture-subverters & overconfidence bias

(A). How ‘subverted’ opportunity happen

The ontology of opportunities for two startup-ventures, PulseCo and WellnessCo, underwent a total and complete transformation in the course of the startup-venturing process (temporal and evolving, tenet of dynamic duality). These two “**venture-subverters**” are shown in the bottom

right-hand quadrant of Figure 5.2. The ontology of the initial MdO venture-opportunities for both the venture-subverters were constructionist in nature, with *existing* market-demand being the root-origin and *new* product supply the instrumental-means to be brought to market. These initial MdO constructionist opportunities are indicated by the oval circles with red-color solid lines in Quadrant II's Cell 2 of Figure 5.1, reproduced below in Figure 5.6.

Figure 5.6 – Venture-subverters' initial & subverted opportunities



As the startup-venturing process progressed however, overconfidence bias (see Paragraph (B) that follows) disoriented the two venture-startups, resulting in the ‘subversion’ of *initial* root-origin (i.e., demand in the existing market) by the instrumental-means (i.e., new product-supply). While the venture-opportunities were still considered mere ‘prospects’ in the initial stage, the ontological nature of the opportunities was ‘inverted.’ In other words, product-supply (hitherto the instrumental-means) was inverted into the positional role of root-origin albeit *quasi*, while existing demand (the initial root-origin) was inverted into being the instrumental-means instead. The dualistic demand and supply elements that constituted the root-origin and instrumental-

means respectively in the ontology of the *initial* MdO constructionist opportunities were thus inverted. From being the initial MdO constructionist opportunity-prospects (the elongated oval circles with unbroken red-color lines in Cell 2 of Figure 5.6's Quadrant II), the opportunities were subverted to assume a PsO regression nature (the elongated oval circles with dotted red-color lines in Cell 3 of Quadrant IV). Table 5.4 summarizes the reasons given by the venture-subverters for subverting the nature of their respective initial opportunity-prospects.

Table 5.4 – Venture-subverters and their subverted venture-opportunities

	'Subverter' of root-origin	Inverted instrumental-means	Venture-outcome & orientation
QUADRANT IV/ Cell 3 (QIV/C3): <i>Subverted</i> regression opportunity (from initial constructionist opportunity)	New product/supply (in place of existing market-demand)	<u>Existing</u> market demand (from new product-supply)	Bringing market to product (in place of bring product to market)
9. PulseCo, from QII/C2 to QIV/C3	<p><i>Demand</i> in <u>existing</u> market was the <i>initial</i> root-origin/trigger and focus (see Table 5.1 under PulseCo), BUT the opportunity's ontology was <u>subverted</u> by <i>new product-supply</i>, which had been the instrumental-means):</p> <p>[175-176] one of our motivation I guess is to change the world, or at least to change medicine world [25] So we did actually changed tact . . .</p> <p>[30-32] the technology that we had um . . . and the <i>product that we developed on that technology</i>, um . . . so I mean much more so than um . . . er . . . starting with a blank sheet of paper <i>from a technology point of view</i></p> <p>[184-185: MORPHED → New PsO-Ontology → Inversion + Subversion of market with product!] on the technical side, we er . . . wanted to build some credibility around um . . . the product so we could actually start selling or marketing the idea to er . . . potential investors</p> <p>[188-189] trying to get it looking more like a . . . a</p>	<p><u>Inversion</u> of initial root-origin (existing demand) into a <i>secondary</i> position as an instrumental-means:</p> <p>[227-228] we weren't doing any user needs validation or anything like that, at that point</p> <p>[198-199] So at that point it (the process) was still um . . . a matter of trying to finish, um . . . to get the product into a more finished form <i>before</i> you actually er . . . bring it on . . . onto the market</p>	<p><u>New – Product-oriented</u> outcome, focused on <i>bringing existing market to new product</i> (the subverter of initial root-origin):</p> <p>[198-199] So at that point it (the process) was still um . . . a matter of trying to finish, um . . . to get the product into a more finished form before you actually er . . . bring it on . . . onto the market</p>

	‘Subverter’ of root-origin	Inverted instrumental-means	Venture-outcome & orientation
	<p>product, um . . . and . . . and clinically validating it</p> <p>[170-171] and it [the product] continued to get more and more interesting as I looked into it [got carried away]</p> <p>[312-313: over-confidence bias] implicitly decided that we would try and <i>take it a bit further</i> before we sell off the IP</p> <p>[226-228] although it was relatively easy to get clinicians interested um . . . from a clinical perspective, um . . . er . . .</p> <p>[198-199] So at that point it (the process) was still um . . . a matter of trying to finish, um . . . to get the product into a more finished form before you actually er . . . bring it on . . . onto the market</p> <p>[264-266] I suppose at that stage it wasn’t even a matter of bringing out a ‘good’ product, it was a matter of bringing out a product that did <i>what we wanted it to do</i></p>		
13. WellnessCo, from QII/C2 to QIV/C3	<p><i>Demand</i> in <u>existing</u> market was the <i>initial</i> root-origin/trigger and focus (see Table 5.1 under WellnessCo), BUT the opportunity’s ontology was <u>subverted</u> by <u>new product-supply</u>, which had been the instrumental-means):</p> <p>[63-64] Well there was the <i>mistake</i> I made. So the first thing I did was to go and build the product, which was in hindsight a 100% the wrong thing to do.</p> <p>[65-66: PsO-RO ONTOLOGY = <u>New Product</u>] actually build <i>all</i> the . . . the product out [68-69] there’s a very big difference between a ‘must have’ product and a ‘nice to have’ product.</p>	<p><i>Inversion</i> of initial root-origin (existing demand) into a <i>secondary</i> position as an instrumental-means:</p> <p>[66-67: PsO-RO Instrumental-means → Bring (mass) <u>existing</u> market to (mass) <u>new</u> product → Cell 3] . . . once we’ve built the product, um . . . we <i>then</i> went to . . . go and try to sell it to . . . to the market</p>	<p><i>New</i> – Product-oriented outcome, focused on <i>bringing existing (mass) market to new (mass-market) product</i> (the subverter of initial root-origin):</p> <p>[222] trying to go out to everyone [for] the product [that] was trying to do everything</p> <p>→ Bring (mass) <u>existing</u> market to (mass) <u>new</u> product</p>

Overconfidence bias was the *general cause* of inversion of the ontological nature of the initial MdO constructionist opportunity-prospects and the consequential disorientation in the epistemology of forming the eventual PsO regression opportunities and exploiting them. Overconfidence bias is one of the two cognitive biases⁵³ that Busenitz and Barney (1997) has identified as being common in decision-making under uncertainty conditions such as those that characterize constructionist, regression, and creation opportunities. The same observation is made by Alvarez, et al. (2010).

In both PulseCo and SoundCo, the subjective confidence of their entrepreneurs' own judgments was much greater than the objective *accuracy* of those judgments. For the **two** venture-subverters, subjective overconfidence bias was particularly high (Pallier, et al., 2002) and manifested in different ways as Table 5.4 suggests. For PulseCo, *overconfidence bias* was due to an *overestimation* (Moore & Healy, 2008) of its performance. It was envisioning to “change [the] medicine world” and was confident of delivering an innovative non-invasive arterial stiffness measurement device based on the founders' technical competences. After all, one of its founders was an anesthetist and the other, a scientist steeped in the domain of blood pressure waveform.

“[The product] was around the technology that we had . . . more than [just] staring with a blank sheet of paper . . .” (PulseCo)

As the product development process got underway however, it became “more and more interesting.” The nascent entrepreneurs got somewhat carried away, overwhelmed by complacency in their technical competences, rather than being mindful of business economics.

“[We] decided that we would try and take it a bit further before we sell off the IP.”
(PulseCo)

Thus *planning fallacy*, or the tendency to overestimate the rate of work and/or underestimate how long to get the product developed (Buehler, Griffin, & Ross, 1994; Kahneman & Tversky,

⁵³ The other cognitive bias is representativeness bias, or the tendency of decision makers to generalize from small samples.

Intuitive prediction: biases and corrective procedures, 1979)⁵⁴, crept in. This in turn gave rise to an *illusion of control* (Langer, 1975), especially on the technical side.

“We wanted to build some credibility around the product, so we could actually start selling or marketing the idea to potential investors.” (PulseCo)

“I suppose at that stage it wasn’t even a matter of bringing out a ‘good’ product, it was a matter of bringing out a product that did what we wanted it to do.” (PulseCo)

In essence, the various manifestations of overconfidence bias caused PulseCo to “change tact,” and subverted and refocused the orientation of its MdO constructionist venture-opportunity away from market-demand (the initial root-origin) towards the development of new product (the initial the instrumental-means). Previously, the venture-outcome was MdO to bring a new product for existing market-demand (the triggering root-origin of the opportunity as an initial prospect). At that stage, PulseCo’s entrepreneur was engaged in “talking to other clinicians about the (product) idea” (see Table 5.1 under PulseCo) to understand existing market needs, and getting the clinicians interested from a clinical perspective. Once overconfidence bias set in, the focus was no longer to bring a product for the market. The company ceased its customer-engagements and user-needs validation. It literally “retreated to a cave” (Wagner, 2013) and became oblivious to customer-needs, the source/trigger of root-origin for its initial MdO constructionist opportunity. Oblivious to market needs, it focused efforts and resources instead on product development. Product (the initial instrumental-means) subverted and became the root-origin of a morphed opportunity having a PsO regression nature instead. From being MdO to bring product to market, the venture-outcome was subverted into PsO to develop the product first and then find a demand for it.

In the case of the second venture-subverter, WellnessCo, the *overconfidence bias* was due to *overprecision* (Harvey, 1997; Hoffrage, 2004), which disoriented its focus. WellnessCo’s entrepreneur saw a potential opportunity with customers in the existing market needing a new

⁵⁴ The planning fallacy, first proposed by Daniel Kahneman and Amos Tversky in 1979, is a phenomenon in which predictions about the amount of time needed to complete a future task display an optimistic bias (i.e., underestimate the time needed).

service solution for health and wellness advice. The initial MdO constructionist venture-opportunity prospect with demand as its triggering root-origin would have oriented the founder to bring a service solution as the instrumental-means for *existing* market-demand as the venture-outcome (see Table 5.1 under WellnessCo). In the process of conceiving the new service solution however, the founder-entrepreneur was overly precise in building a “must have product,” which the market regarded only as a “nice to have product.”

“Well there was the mistake I made. So the first thing I did was to go and build the product, which was in hindsight a 100% the wrong thing to do. So I worked with some developers, overseas to develop the product, to actually build all the product out.”

(WellnessCo)

Overconfidence bias manifesting as overprecision therefore turned the founder-entrepreneur into a ‘product-hermit’ by sidelining customers and developing the service solution independent of their needs (Wagner, 2013). Existing market demand was thus relegated as the instrumental-means to be brought to offtake the new service solution instead. The initial MdO constructionist opportunity was thus subverted into a PsO regression opportunity.

(B). Overconfidence biases and disorientation of subverted opportunity’s outcome

Several observations can be made from the foregoing exposition.

- (a) Consistent with the yin-yang tenet of dynamic duality, the yin or yang state of opportunities is malleable, and can morph and be transformed (see [Section 3.4.2](#)) when interacting with entrepreneurs having overconfidence biases in estimation and precision as identified in this research.
- (b) Even when overconfidence bias subverts the *initial* root-origin with the instrumental-means, the latter in its ‘new’ positional role as the *quasi* root-origin will orientate the venture-outcome as explained by the conceptual O-O-P framework. In the spirit of the yin-yang notion (see [Section 3.5.2.4](#)), the root-origin (albeit quasi) will *ipso facto* be the venture-outcome for the instrumental-means to

fulfill the opportunity as subverted. It will serve the interests of a startup-venture even with a subverted opportunity to recognize the orientations and O-O-P causality pattern – that is, that the venture-outcome is isomorphically *the fulfillment of the opportunity's root-origin even as subverted*. Delaying or failing to acknowledge the phenomenon can lead to dire consequences.

For instance, it took PulseCo's entrepreneur eight years to recognize the influential role of the quasi root-origin over the venture-outcome for the PsO regression opportunity subverted from the initial MdO opportunity. On hindsight, he felt that PulseCo could have taken steps earlier to drive the market to its PsO medical device.

"We could have done quite well I think by doing the license deal with Welsh Allyn." (PulseCo)

"We started to think about whether we wanted to . . . sell the IP."
(PulseCo)

". . . it was a matter of getting somebody with fairly deep pockets to . . . get the product out to market I think." (PulseCo)

The realization *finally* prompted him to *sell* PulseCo's business at "a reasonable offer" as a means of bringing and driving the market to its PsO medical product.

In contrast, WellnessCo's entrepreneur did not understand the pivotal role of root-origin (even quasi) in influencing the venture outcome. By making the development of product as the focus and quasi root-origin (thereby subverting his opportunity from its initial MdO constructionist to a PsO regression nature), he should have also re-oriented the venture-outcome as being PsO in nature as well. In other words, he should have driven the market and brought customers (such as by way of trade sale, licensing or selling the IP, and so on) to the service solution he built as a "must have" for the opportunity subverted as PsO. Instead, he brought the PsO solution to customers *as though* it was an MdO product tailored to market needs. It became a *mismatch* because the market did not regard the solution as a necessity. The

disorientation and *mismatching* of quasi root-origin (of the subverted PsO regression opportunity) with the venture-outcome of the initial MdO opportunity-prospect proved fatal.

“[I] was building a product without doing the validations . . . which ultimately led to the failure of the company.” (WellnessCo)

- (c) Overconfidence has been called the most “pervasive and potentially catastrophic of all the cognitive biases to which *human beings* fall victim” (Plous, 1993). In the context of *startup-ventures*, overconfidence bias can precipitate rippling effects that can be devastating. They include the following:

- (i) The costs of startup venturing can become exorbitantly high. WellnessCo for example suffered “a lot of cash-burn.” Whereas the initial MdO opportunity could have entailed the simple act of bringing a service solution to market customers who need it, pursuing a subverted PsO opportunity involved a very different process, which WellnessCo failed to recognize.

“We were trying to go out to everyone and the product was trying to do everything.” (WellnessCo)

In the end, WellnessCo lost money in trying to drive the existing market *en masse* to its product as the venture-outcome for the subverted PsO opportunity.

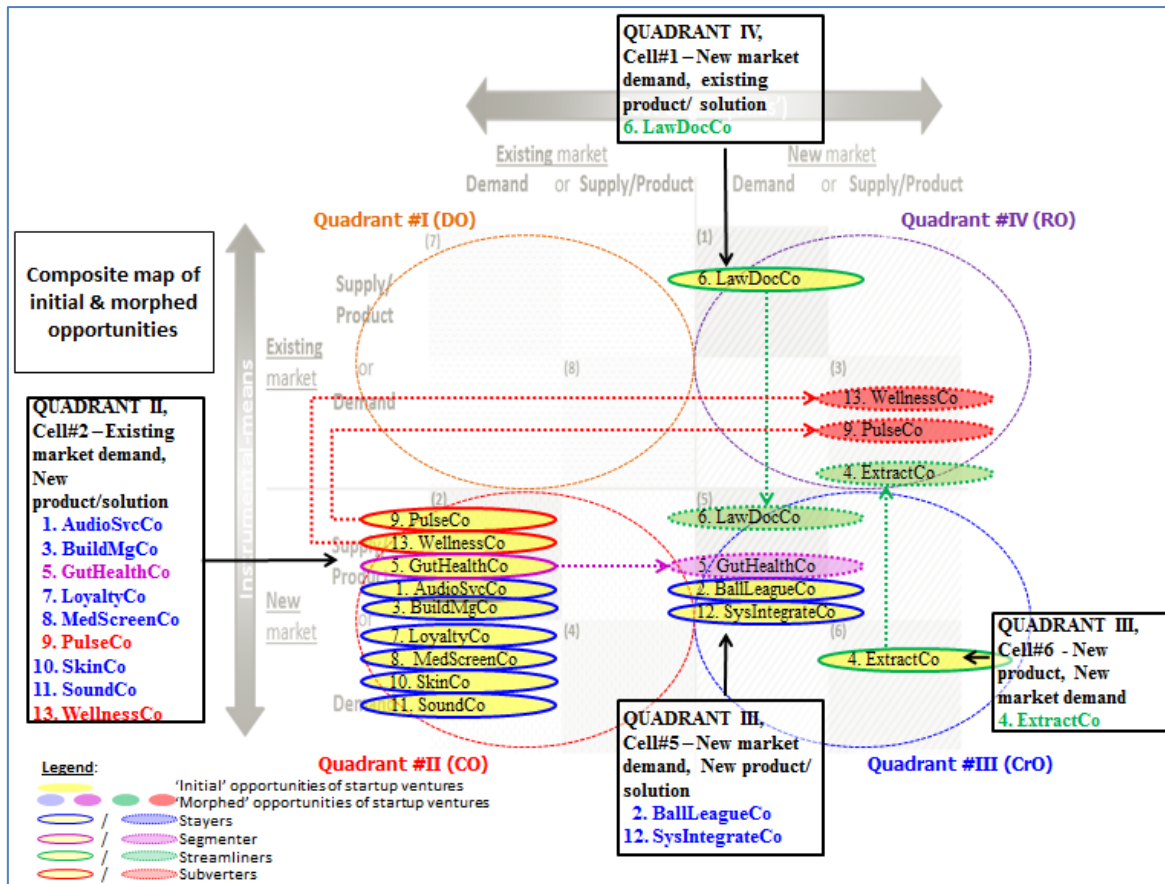
- (ii) Pursuing a subverted opportunity can unnecessarily extend the *time* taken for a startup-venture to grow and achieve an ‘exit.’ It took “8 years” for PulseCo’s founders to sell out.
- (iii) Even worse, a startup-venture risks *failure* by subverting root-origin with the instrumental-means of its initial opportunity. It happened to WellnessCo.

“[I]t was always kind of die a very painful death.” (WellnessCo)

5.2.4 Section summary

The opportunity-hexadecadrant in Figure 5.7 provides a snapshot of the initial and morphed opportunities discussed above.

Figure 5.7 – Composite hexadecadrant of opportunities in their initial and morphed states



In general, the empirical findings in regard the ontology of opportunity can be summarized as follows:

- Opportunity is a dualistic nexus, comprising sources of change manifesting as the *elements of demand and supply* (yin-yang tenets of holistic and dialectical duality).

- (b) There is a *variety of opportunities* in multiple forms, arising from different ends-means or means-ends interactions between demand and supply in existing and/or new market settings (yin-yang tenet of dynamic duality).
- (c) There is *internal validity* in the causal connections and orientation phenomenon as conceptualized by the O-O-P framework between the root-origin, and the succedent variables of instrumental-means and venture-outcome. For each opportunity, the *root-origin* defines and orientates the *instrumental-means* and the *venture-outcome* (see [Section 3.5.2.4](#)).
- (d) The empirical findings across the multiple cases provide direct results and contrasting conditions (for predicted reasons) as *literal* and *theoretical replications* respectively that confirm the O-O-P framework's *external validity*. The empirical findings are *analytically generalizable* to the explanations and notions of the conceptual O-O-P framework:
 - (i) The *initial* opportunities of all the 13 venture cases (regardless of whether they are the stayers, segmenter, streamliners, or subverters) are literal replications, demonstrating the predicted pattern of the root-origin as being the *antecedent* focus that unifies and orientates the instrumental-means and venture-outcome (see [Section 3.5.2.4](#) and Figure 3.12).
 - (ii) The venture-segmenter and venture-streamliners provide *theoretical replications*, demonstrating that the predicted chain of causality connections and orientations in the order of O-O-P as conceptualized by the framework for the respective opportunity-types do not change, even when the antecedent *initial* root-origin is segmented or the instrumental-means streamlined.
 - (iii) The venture-subverters present *theoretical replications* for predicted reasons – attempts to subvert the causal connections and orientations by *turning* the instrumental-means into quasi root-origin in lieu of the *initial* root-origin will result in a venture-outcome for the subverted opportunity that is *antithetical*

to the one for the initial opportunity. A startup-venture that fails to understand the causality can suffer disastrous consequences for (see Paragraph (B) of Section 5.2.3.3).

According to Drucker (2011), management's failure in questioning "“what is our business?” . . . in a clear and sharp form . . . is perhaps the most important single cause of business failure” (2011, p. 43). To his comment, this thesis adds that the more concise question for a startup-venture to ask is “What is *the market-opportunity for* our business?” Understanding ‘opportunity’ in the IO-nexus of start-up entrepreneurial process with the entrepreneur is the area where the conceptual O-O-P framework of this research provides the answer and guidance.

5.3 Epistemology of opportunity formation (and evaluation)

The preceding section describes how an initial venture-opportunity can morph for various reasons. This section focuses on the opportunity formation processes, exploring how startup-ventures form their respective opportunities.

5.3.1 Empirical findings

Empirical findings show that the 13 startup-venture cases interviewed in this research follow various epistemologies when forming their 13 initial opportunities, albeit five of the initial opportunities morphed into variants. They bear orientations that are either MdO or PsO, depending on their respective root-origin.

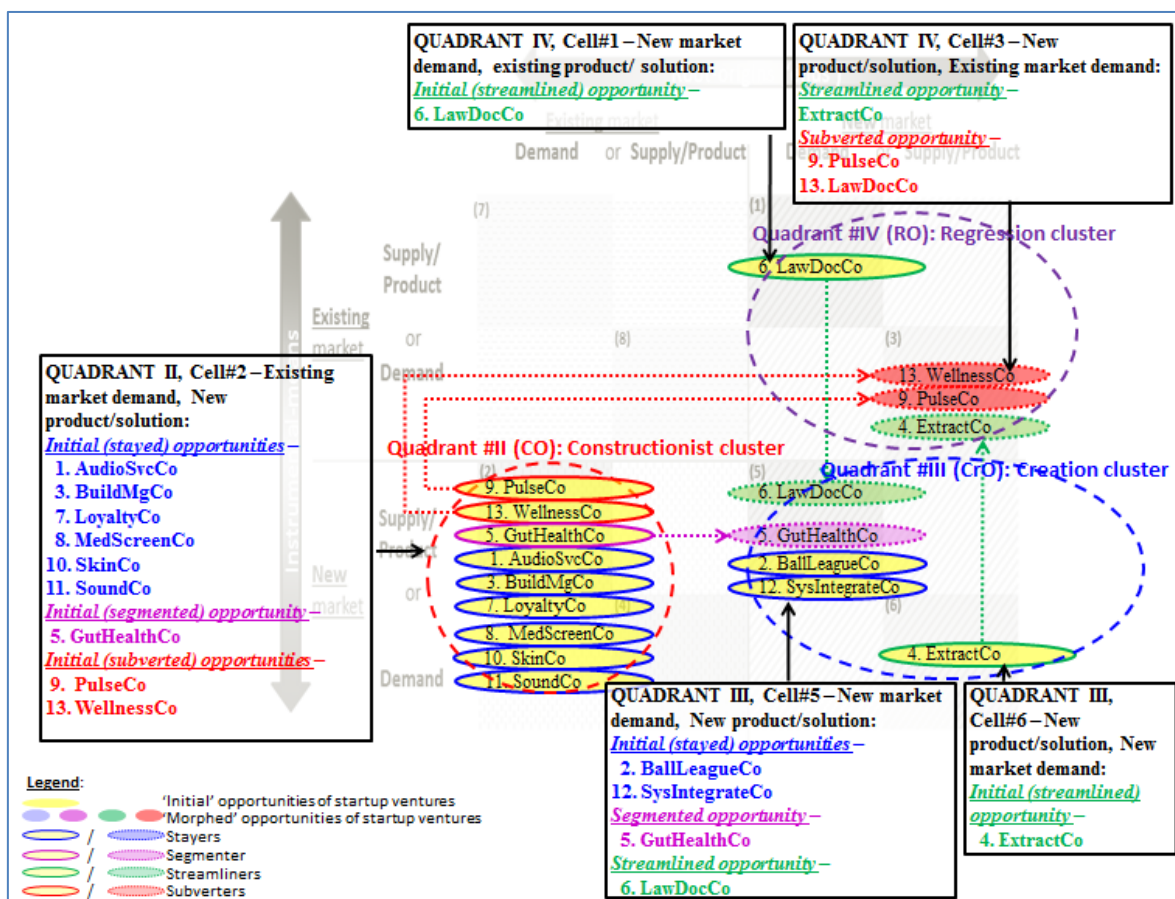
5.3.2 Analysis

The opportunity-hexadecadrant in Figure 5.7, reproduced below as Figure 5.8, is used to help visualize the empirical findings. It shows the startup-ventures and their 13 initial opportunities with different ontologies of root-origin and instrumental-means being dispersed in different

market scenarios. They are represented by the elongated oval circles with unbroken lines. The opportunity-hexadecadrant also captures the variants that morphed from five of the initial opportunities. These variant opportunities (represented by the elongated oval circles with dotted lines) are linked to by the dotted arrows to their respective initial opportunity-prospects from which they morphed.

As Figure 5.8 shows, the 13 startup-ventures with their initial opportunities reside in different opportunity-quadrants, each of which is associated with a certain type of epistemology for opportunity-formation.

Figure 5.8 – Epistemologies of initial and morphed opportunities



The following observations can be made from Figure 5.8:

(a) 13 initial opportunity-prospects

- (i) Nine venture-cases (AudioSvcCo, BuildMgCo, GutHealthCo, LoyaltyCo, MedScreenCo, PulseCo, SkinCo, SoundCo, and WellnessCo) had prospective initial opportunities within the epistemological Quadrant II. They started as *initial* constructionist opportunity-prospects of the Cell 2 type having an MdO nature. Of these –
 - (1) six (AudioSvcCo, BuildMgCo, LoyaltyCo, MedScreenCo, SkinCo, and SoundCo) were eventually formed and ‘stayed’ as MdO constructionist opportunities of the Cell 2 type;
 - (2) one (GutHealthCo) subsequently became a MdO creation opportunity of the Cell 5 type in epistemological Quadrant III when the entrepreneur *segmented* the root-origin of its initial opportunity (which was demand in the existing marketplace) to focus on a new market niche; and
 - (3) two (PulseCo and WellnessCo) subsequently morphed into PsO regression opportunities of the Cell 3 type in epistemological Quadrant IV when the root-origins of their respective initial opportunities (which was demand in the existing marketplace) *subverted* by the instrumental-means.
- (ii) Three venture-cases (BallLeagueCo, ExtractCo, and SysIntegrateCo) had prospective opportunities in Quadrant III with *evolutionary-realist* epistemological tendencies as *initial* creation opportunities. Of these –
 - (1) two (BallLeagueCo and SysIntegrateCo) had initial MdO creation opportunities of the Cell 5 type in Quadrant III which were eventually formed and *stayed* as such; and

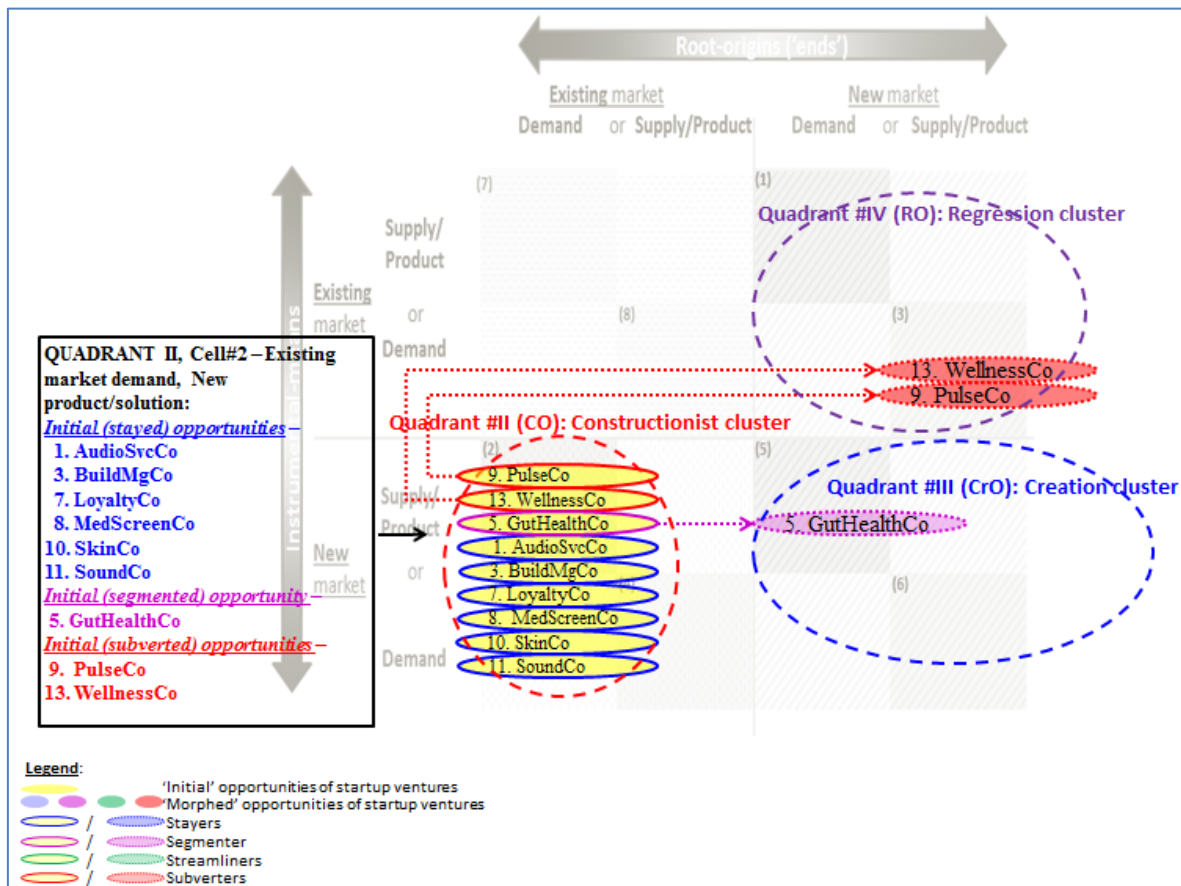
- (2) one (ExtractCo) had its initial PsO creation opportunity of the Cell 6 type in Quadrant III but subsequently *streamlined* into a PsO regression opportunity of the Cell 3 type in Quadrant IV.
 - (iii) One venture-case (LawDocCo) had its initial MdO regression opportunity of the Cell 1 type in Quadrant IV but subsequently *streamlined* it into an MdO creation opportunity of the Cell 5 type in Quadrant III.
- (b) 5 morphed opportunities
- (i) There is a *segmented* MdO creation opportunity of the Cell 5 type in Quadrant III belonging to a GutHealthCo, which was morphed from its initial status as an MdO constructionist opportunity of the Cell 2 types in Quadrant II.
 - (ii) There are two *streamlined* derivatives, comprising –
 - (1) an MdO creation opportunity belonging to LawDocCo of the Cell 5 type in Quadrant III, which started as an *initial* MdO regression opportunity-prospect of the Cell 1 type in Quadrant IV; and
 - (2) an PsO regression opportunity belonging to ExtractCo of the Cell 3 type in Quadrant IV, which was morphed from its initial status as an MdO creation opportunity-prospect of the Cell 6 type in Quadrant III.
 - (iii) There are two *subverted* PsO regression opportunities of Cell 3 type in Quadrant 3 belonging to PulseCo and WellnessCo morphed from opportunity-prospects that were initially MdO constructionist opportunity-prospects of the Cell 2 type in Quadrant II.

As mentioned in Section 4.4.2, both the number of opportunities in their initial and morphed ontological states, as well as the dispersion in terms of their epistemological traditions, help to illuminate the research questions, and to achieve *replication* (rather than sampling) logic (Eisenhardt, 1991; Yin, 2009).

5.3.2.1 Constructionist epistemological cluster

Following from the analysis in Paragraph (a)(i) of Section 5.3.2, there were nine opportunity-prospects within the *constructionist* epistemological cluster (Opportunity-quadrant II). As Figure 5.9 shows, all nine prospective opportunities were MdO and *initially constructionist* in tendency. Six of them ((AudioSvcCo, BuildMgCo, LoyaltyCo, MedScreenCo, SkinCo, and SoundCo) eventually *stayed* and formed into constructionist opportunities as they were, although one (GutHealthCo) was subsequently *segmented* to become a creation opportunity, while two (PulseCo and WellnessCo) were *subverted* to form as regression opportunities.

Figure 5.9 – Venture cases with constructionist opportunities

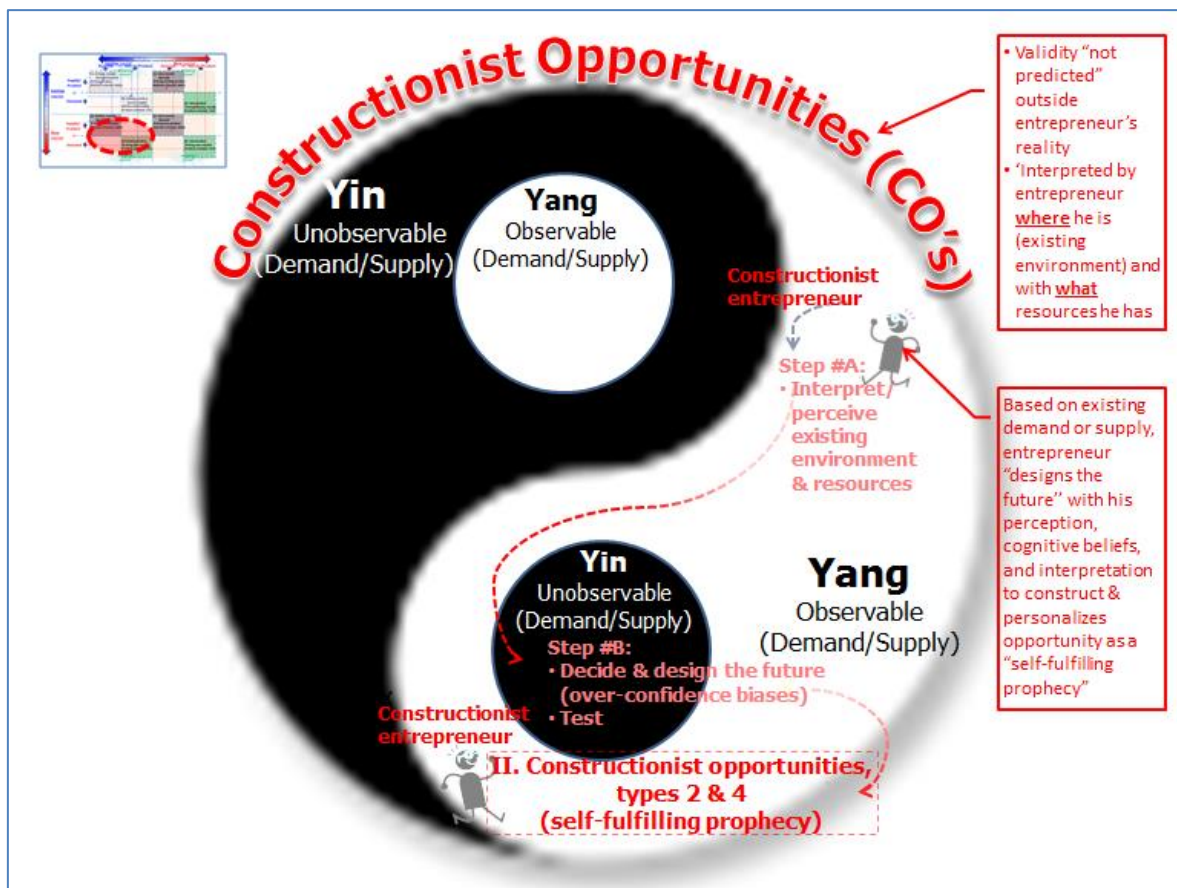


(A). *Literal replications – Venture-stayers*

The epistemological formation processes for six venture-stayers with initial constructionist opportunity-prospects ‘stayed’ *focused* on, and were *oriented* by, the respective *root-origins* that triggered their opportunities initially. The end-consequence was that their ontological nature emerged unchanged to remain as MdO constructionist opportunities, thus becoming the ‘*self-fulfilling prophecies*’ as the O-O-P framework has conceptualized.

Figure 5.10’s Taijitu (a more detailed rendering of Figure 3.16) provides a visual summary of the epistemological process for the formation of constructionist opportunities, which typifies what the initial opportunity-prospects of the six venture-stayers went through in practice.

Figure 5.10 – Epistemology of constructionist opportunity



(1). Initial constructionist-opportunities of venture-stayers

(a). AudioSvcCo

The entrepreneur of AudioSvcCo detected and interpreted the inability of Chinese firms to synchronize the audio and video tracks with precision as a sign of operational and technical weakness in the post-production sector of China's film industry (Step #A in Figure 5.10). He perceived his experience from working on big films as an *existing* resource for him to deliver a product that would solve the needs of Chinese post-production firms. Since the actual status in terms of the level of weaknesses and needs were unobservable beyond his own perception (Step #B), he went on a fact-finding trip organized by Film New Zealand. Conversations with the Chinese operators justified his cognitive belief and validated plans to design the future development of new and innovative project collaboration tools (Step #B), which made his plans to meet the market gap in China a self-fulfilling prophecy (Caption II in Figure 5.10).

“[P]roject management controls I think is our point of difference that we're actually bringing.” (AudioSvcCo)

(b). BuildMgCo

BuildMgCo also perceived and identified a problem in the *existing* environment where builders lacked the ability to estimate construction costs (Sept #A in Figure 5.10). Its operating experience in the industry was perceived to be an existing resource for designing and building a computerized peer-to-peer collaboration system. To test and prove the concept (Step #B), it pulled together a team and mustered existing resources to prototype and develop the software. The conversations it had with potential customers helped to clarify actual needs (Step #B), and prove the core idea and technical feasibility which prompted the entrepreneur to embark on BuildMgCo as a startup venture, thereby making his initial perception of opportunity a self-fulfilling prophecy (Caption II in Figure 5.10).

“[S]o basically the next step was then to put together a business case . . . for funding grant.” (BuildMgCo)

(c). LoyaltyCo

In LoyaltyCo's case, its entrepreneur identified and interpreted from a social contact the need for a loyalty card that can be used across multiple retail stores (Step #A in Figure 5.10). With his good grasp of mathematical algorithms, he was positive that such a loyalty card could be programmed to meet consumers' want. He proceeded to evaluate and test the market (Step #B) by analyzing the strengths and weaknesses of competitors. He also conducted "market survey and research" to get feedbacks, and tease out the unobservable (Step #B). These formative efforts enabled him to construct a "new model" to supply a card with value propositions that satisfied consumers' desire to spend their loyalty points "anywhere" as a self-fulfilling prophecy of his initial perception.

"I set up the company." (LoyaltyCo)

(d). MedScreenCo

The founder of MedScreenCo was a medical doctor with the immigration department where he perceived the "hassles" of doctors having to fill up blood test forms for applicants, and then schedule appointments with nurses for the tests. He *interpreted* that these difficulties exist also in the market for health insurance and need to be resolved (Step #A in Figure 5.10). He assessed gaps in workflows among the clients, the clients' brokers, and the insurance companies (Step #B). He also evaluated and determined the *pain-points* in the value-chain, such as where the need was, and who was actually paying – issues perceived but hitherto unclear and/or not observable. Based on his interpretations, as well as his belief in being able to access nationwide nursing services as an existing resource, the entrepreneur then proceeded to design and construct an automated system to fulfil the opportunity (Caption II in Figure 5.10). The focus of the opportunity-formation process was "all about the client," the initial root-origin of the opportunity.

"So it's our job to sort of make all that as easy and convenient for the client as possible . . . and that's what we do. So it's all about the client . . ." (MedScreenCo)

(e). SkinCo

SkinCo knew that the market exist for treatment of skin ailments (Step #A in Figure 5.10). However, the process of opportunity-formation required verifying some of the unobservable market conditions (Step #B) such as:

“... what the future products were . . . what’s going to be on the market for the next couple of years, as well as what’s currently on the market.” (SkinCo).

The market survey was done in by bringing product ideas that addressed the consumers’ need. She talked to potential consumers and pharmacies. The fact-finding enabled her to determine that the biggest market need was for eczema treatment. The entrepreneur was cognizant of her limited financial resources, which had to be supplemented by investors’ money to design a product for the market but personalized with the entrepreneur’s scientific knowhow. It led to the manufacture of a new eczema lotion, which became a self-fulfilling prophecy in meeting what the market needed (Caption II in Figure 5.10). The product leveraged heavily on the resources of the entrepreneur’s human capital, in terms of experience, education, and prior knowledge (Marvel & Lumpkin, 2007).

“[W]ell I have previously worked in the area of eczema . . . and I’ve also worked at other companies like LIVING NATURE™, and COMVITA™ . . . and I basically could just see that there’s this massive gap in the area of eczema.” (SkinCo)

(f). SoundCo

The audio-to-video conformance software that SoundCo decided to bring to the market was also very much a valid and self-fulfilling prophecy based on the ‘reality’ that the entrepreneur had worked on the sound tracks of the *Lord of the Rings* film as a post-production provider. His knowledge of the *existing environment* enabled him to perceive, decide, and evaluate the existence of a gap in the market that was not served by any available software. Using the domain skill and knowledge, which were his existing resources, he personalized and designed an innovative software product that can be brought to satisfy market needs as the self-fulfilling prophecy (Caption II in Figure 5.10).

“*[W]e had lots of different scenarios that tested the software quite extensively.*”
(SoundCo)

(2). *Analytical generalizability of literal replications*

As the empirical findings show, the processes of evaluating the initial opportunities and forming them by the six venture-stayers are *literal replications* of the epistemology for *constructionist* opportunities as conceptualized and explained by the O-O-P framework. Specifically, the constructionist opportunities are self-fulfilling prophecies that stemmed predictably from the formation process and evaluation actions of the entrepreneurs, *oriented* by the opportunity’s *root-origin* in the existing and known market environment (Step #A in Figure 5.10).

In the market-setting for constructionist opportunities, the entrepreneurs formed their opportunities by interpreting the environment *as it exists* – *where they are* in time and space (i.e., Step #A in the white *yang* area of Figure 5.10). They perceived and recognized *what they had* at hand in terms of human capital (domain experience, knowledge, and skill) and money resources, as Baker and Nelson (2005) and Sarasvathy (2001) theorized. In designing the future, the raw data gathered from the existing environment on the known and existing root-origin is given meaning by the respective entrepreneurs, allowing subjective interpretations to be formed for the instrumental-means that needs to be brought, even though the exact nature thereof may be not be clear (Alvarez, et al., 2010). The empirical findings thus show that the constructionist entrepreneurs will have to collect information, *validate*, and *test* matters that are *yet unknown* (per Step #B within the black dot of the white *yang* observable area in Figure 5.10). Their actions are oriented by the root-origins, and include the following:

- (a) Market feasibility analysis, such as gap-analysis, scenario analysis, value chain analysis, competitive analysis, and market survey and research (e.g., talking with potential customers, fact-finding mission, and so on).
- (b) Business planning & interfunctional coordination, like prototyping, proving of core idea or concept, and getting feedbacks.
- (c) Competitive analysis and market differentiation strategy.

Incidentally, many of these approaches in the constructionist settings are also used in a realist setting for discovery opportunities, which can also include “government reports, trade association reports, focus groups, and direct observation” (Alvarez, et al., 2010, p. 35). Eliciting and clarifying the unknown (Step #B in Figure 5.10) helps to confirm entrepreneurs’ *cognitive beliefs*. In this regard, the knowledge of root-origin that exists enables them to set venture-outcomes on an *a priori* basis. The *a priori* venture-outcome then directs the actions and processes (Alvarez, et al., 2010) taken to evaluate, decide, as well as complete the final design, personalization, and formation of the constructionist opportunity to fulfill the root-origin as the isomorphic outcome (Step #B and Caption II in Figure 5.10). The entrepreneurs’ perception of their environment aids the determination of *a priori* venture-outcome for the constructionist opportunity. They are thus able to process data (in terms of how and what kind to collect), interpret or give meaning to the data, and apply their available resources in new constructionist forms of ends-means relationships (Baker & Nelson, 2005; Daft & Weick, 1984; Mahoney & Michael, 2005). In this manner, the constructionist opportunity (and its venture-outcome) becomes a self-fulfilling prophecy or reality (Alvarez, et al., 2010), bearing dualistic elements that comprise the root-origin identified as the *a priori* venture-outcome from the existing environment and the relevant type of instrumental-means to be brought.

(B). Theoretical replications – Venture-segmenter and venture-subverters

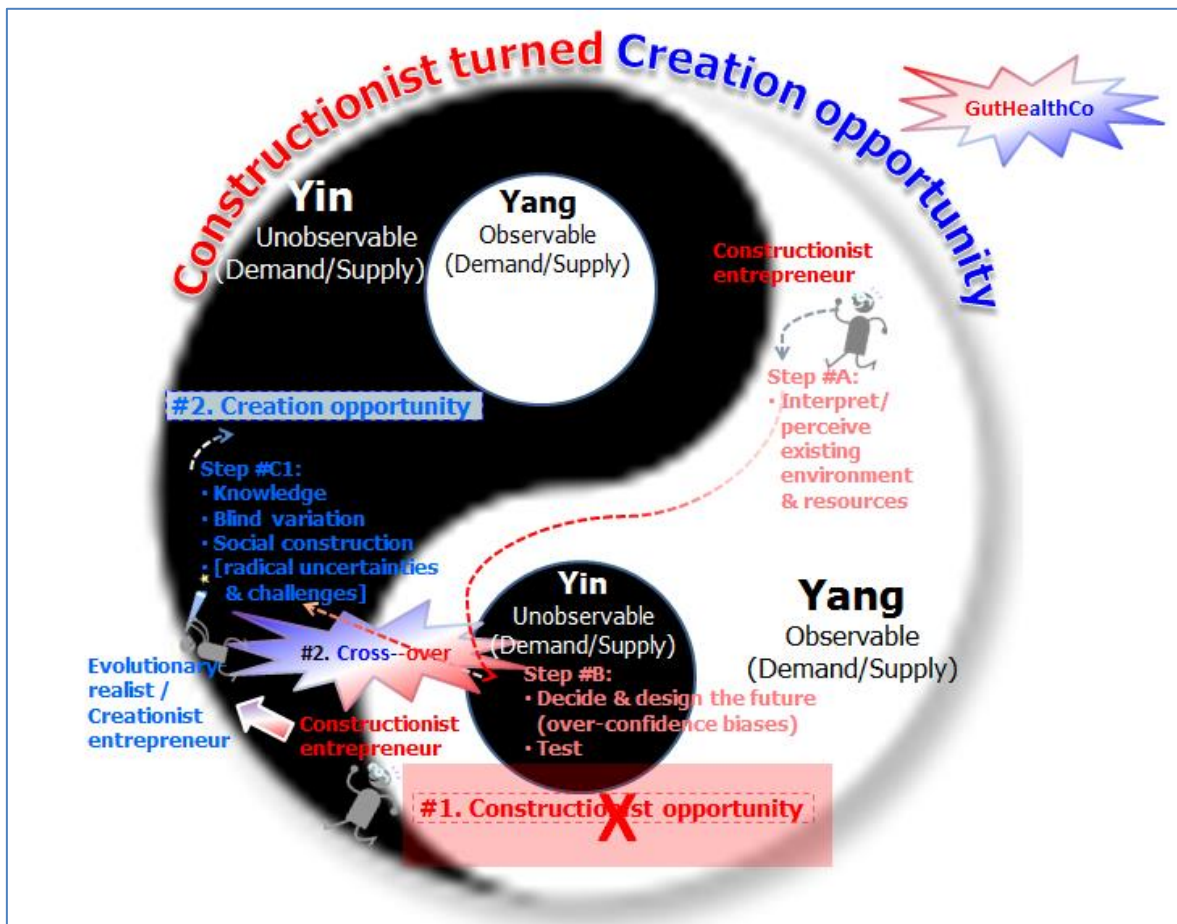
Of the *initial* constructionist opportunity-prospects for the other three startup-ventures, GutHealthCo’s was *segmented* during the process of opportunity-formation, while that of PulseCo and WellnessCo were *subverted*. The three ventures with their morphed opportunities present *theoretical replications* for this research and, as cross-cases, are analytically generalizable to the conceptual O-O-P framework. They reveal contrasting epistemological processes that stemmed ultimately from the entrepreneurs’ deliberate decisions to alter the root-origin of their respective opportunity-prospects. The decisions impeded the self-fulfilling prophecy of opportunities being formed by the constructionist epistemological process (Figure 5.10) that is part of the conceptual O-O-P framework.

(1). Constructionist-prospect segmented into creation opportunity

At the initial stage, GutHealthCo's prospective opportunity before being segmented was *constructionist* in the making. As a new venture, the challenge GutHealthCo faced was to innovate and develop a *new* product in the *existing* market for general constipation remedies. GutHealthCo was selling an *existing* product but it was not working the way it should as a constipation remedy. It had to be replaced with a new product.

Using the Tajitu as a graphical illustration, GutHealthCo was in the white *yang* (observable) tadpole area (see Step #A in Figure 5.11), where the ineffectiveness of its existing product as an objective reality was *observable* in the *existing* environment where it was sold.

Figure 5.11 – GutHealthCo: Transitioning from constructionist epistemological formation to evolutionary-realist



Then to *verify* the *validity* of the initial cognitive *belief* that a new product was needed, the entrepreneur must decide on and design the future product that could address the unfilled existing needs. The formulation of ingredients for the new product was unknown or not fully apparent. In the context of the Taijitu, this dilemma requiring actions to elicit answers is represented by the small black *yin* (unobservable) dot per Step #B in Figure 5.11. Thus, to test the market and design the new product, the entrepreneur had to visit pharmacies, doctors, and consumers. She also surveyed competing products already in the market, like Metamucil™, Fybogel™, and so on, to identify ‘gaps’ and needs. This venturing process and actions aligned with the MdO opportunity-prospect and followed the tradition of *constructionist* epistemology as conceptualized by the O-O-P framework.

Had GutHealthCo continued the processes through to completion, the *expected* result would have been a *constructionist* opportunity being formed as a self-fulfilling prophecy of the initial opportunity-prospect. As it turned out however, the constructionist opportunity *did not materialize* (refer to Caption #1 in Figure 5.11) because the company deviated from the constructionist epistemological processes at the ‘designing the future’ phase (see Step #B in Figure 5.11) to focus on a *new market-niche*.

Empirical findings revealed that *after* collating the information from market research, the entrepreneur decided to “*completely re-designed* the kiwi fruit product” to target irritable bowel syndrome (IBS). In other words, rather than meeting demand in the *general* and *wider* market for constipation treatment, which was the *initial root-origin* of the opportunity-prospect, the new innovative product as the instrumental-means would specifically target a *niche* segment which GutHealthCo created as new.

“We needed to be targeting IBS that is pure constipation. So . . . we actually created a new category which became like the digestive health category, and we have basically grown the gastro-intestinal category in all the pharmacies.” (GutHealthCo)

Ontologically, the decision to *segment* the initial root-origin effectively *changed* the *nature* of GutHealthCo’s MdO opportunity-prospect from the Cell 2 type in Quadrant II (see Figure 5.4 and Figure 5.9) to MdO creation opportunity of the Cell 5 in Quadrant IV. The *new* MdO

venture-outcome was thus re-oriented to bring a *new/re-designed product* as the instrumental-means to meet *niche* demand in a *new* market-segment, which was also the segmented root-origin for the new creation opportunity.

Epistemologically, the focus on a *new* market-*niche* meant that GutHealthCo *crossed over* into the black yin (unobservable) area of the Taijitu (refer to Caption #2 in Figure 5.11). Opportunity-formation process that hitherto followed the *constructionist* epistemological tradition was abandoned in favor of *evolutionary-realist* tradition, which suited the formation of opportunity in the *yin* environment for the new market-segment where the uncertainties and challenges were different.

More discussion on what the consequential evolutionary-realist epistemological formation process involved can be found in Paragraph (B)(1) of Section 5.3.2.2. Suffice it is to say that MdO *constructionist opportunity* as conceptualized by the O-O-P framework *did not materialize as a self-fulfilling prophecy per se* for GutHealthCo, the venture-segmenter. This was due to the change in ***decision*** to ***segment*** the initial root-origin and focus on bringing a new product to a brand new *niche* in the wider market as a new venture-outcome. It caused the epistemological formation processes to deviate from *constructionist* to the *evolutionary-realist* tradition, resulting in a ***contrasting condition*** to the O-O-P framework's explanations. GutHealthCo eventually ended up with forming an MdO *creation* opportunity (refer to Caption #2 in Figure 5.11), which was oriented by the new market segment as the root-origin (i.e., Cell 5 of opportunity-quadrant III in Figure 5.4 and Figure 5.9).

(2). *Constructionist-prospects subverted into regression opportunities*

At the initial stage *prior* to the root-origin being *subverted*, the *prospective* opportunities of the two venture-subverters (PulseCo and WellnessCo) were also *constructionist* in the making. Both needed to evaluate the *prospects* of offering *new* and innovative *product-solutions* to their respective *existing* markets. In both instances, they could perceive and interpret the nature and validity of their respective opportunity-prospects in the existing markets *where* the entrepreneurs were and had some *resources* (human and/or money capital).

While working as an anesthetist in the hospital, PulseCo's founder perceived a need in the *existing market* for physiological information pertaining to cardiac output, which is "a fairly well-known clinical need in the cardiovascular health domain of general practitioner primary medical care market segment. Based on his cognitive belief in the value of such information to the clinicians, the founder enlisted a mechanical engineer as his co-founder to *design* and develop a prototype.

"So the next stage after building that prototype was take it into the hospital or to take a slightly different version into the hospital, and record some data." (PulseCo)

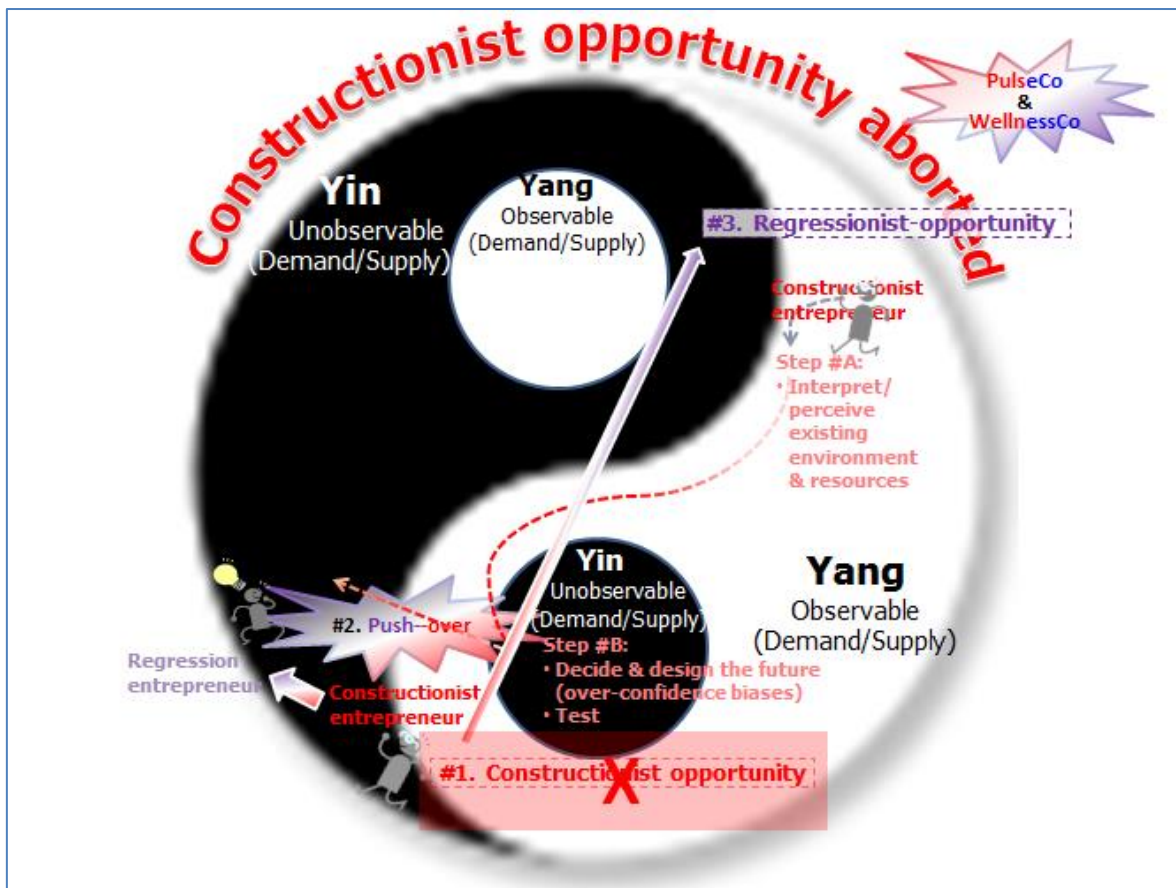
In the case of WellnessCo, the entrepreneur perceived the existence of a market for health and wellness services, and validated and evaluated it through his friend.

"[T]here seemed to be an opportunity to make those [health services] available online. So less people-orientated and more something that people could log into online, and have access to . . . to all of their information. That's really where it came about."

(WellnessCo)

For the venture-subverters (PulseCo and WellnessCo), they both were in the white *yang* (observable) tadpole area of the Taijitu where their respective opportunity-prospects were first perceived and interpreted (see Step #A in Figure 5.12). However, there were certain matters that remained *unobservable* and unknown, as represented graphically by the small black *yin* (unobservable) dot of the Taijitu (see Step #B in Figure 5.12). Such matters that needed to be *tested, clarified, and understood* include the exact nature of customer needs so as to *decide* how to design the *future* appropriately to address them.

Figure 5.12 – PulseCo and WellnessCo: Aborting constructionist epistemological formation to transition into regressionist



In consequence, PulseCo and WellnessCo behaved like GutHealthCo (the venture-segmenter) by *generally* following the constructionist epistemological process, which if diligently adhered to would have led to the *self-fulfilling prophecy* of their initial opportunity-*prospects* being formed as MdO constructionist opportunities. Like GutHealthCo however, the two venture-subverters then deviated from the constructionist epistemological formation process during the testing and decision phases of designing the future (see Step #B in the black *yin* (unobservable) dot in Figure 5.12). Their deviations were caused by *overconfidence biases* manifesting as *overestimation* and *overprecision* in PulseCo and WellnessCo respectively (see Paragraph (A) of Section 5.2.3.3). They turned product innovation, development, and supply into the entrepreneurs' overarching *preoccupations* and sole foci in place of market need.

Using the opportunity-hexadecadrant in Figure 5.6 and Figure 5.9 to illustrate, the shift of *focus* to new product in each of the venture-subverters changed the initial ontological nature of their opportunity-prospects from the Cell 2 type MdO constructionist opportunity in Quadrant II to the Cell 3 type PsO creation opportunity in Quadrant IV. For both PulseCo and WellnessCo, new *product* (hitherto the instrumental-*means*) subverted market demand (the initial root-origin) to become the *quasi* root-origin (and therefore the *quasi* venture-outcome or ‘end’). Without realizing, what the venture-subverters *then* had were *morphed* opportunities of a PsO regression nature with venture-outcomes that should be oriented towards bringing existing demand to new products/services, in contrast to the initial MdO constructionist opportunity-prospects that would have required the delivery of new products to meet existing needs as the ventures-outcomes.

In this connection, the findings do in fact reveal the change in the orientation of the epistemological *process* taken to form the subverted opportunities and achieve the outcomes. The re-alignments in formation process for the subverted opportunities are consistent with the causality O-O-P patterns as described by the conceptual framework. Rather than following a MdO path, the findings showed that the *testing* and *decision* phases of *designing* the ‘future’ opportunities in the venture-subverters were focused on and oriented towards the research and development of new products, hitherto the instrumental-*means* but became the quasi root-origin *ex-post* subversion. Their epistemological processes *deviated* from MdO to PsO because the *overconfidence bias* favored *product*. MdO activities were absent.

“[T]he only real market survey or market feedback that we’d had was from Nigel (the founder . . . We weren’t doing any user needs validation or anything like that, at that point.” (PulseCo)

“So . . . I worked with some developers overseas to develop the product, to actually build all the product out. . . . [O]nce we’ve built the product, we then went to go and try to sell it to the market.” (WellnessCo)

To illustrate with the Taijitu, PulseCo and WellnessCo were having some level of uncertainty at the small black *yin* (unobservable) dot (Step #B of Figure 5.12) when designing and bringing *new* innovative products as MdO venture-outcomes for their MdO opportunity-prospects

initiated by the interpretation and perception of existing market needs. However, *overconfidence bias* made product development the focus and ‘pushed’ the formation processes over into the much bigger, black (unobservable) tadpole area (Caption #2 in Figure 5.12). Unbeknownst to the venture-subverters, much greater uncertainties were involved because *ex-post* the subversion, they would have to make *blind-variations* in product research and development without regard to the realities of market needs that existed. Their opportunity-prospects was no longer MdO constructionist in nature (Caption #1 in Figure 5.12) but became PsO regression (Caption #3 in Figure 5.12). Instead of having to bring new products to the existing market (Cell 2 in Quadrant II of Figure 5.6 and Figure 5.9), the venture-subverters would then have to bring the market to their products (Cell 3 in Quadrant IV of Figure 5.6 and Figure 5.9). The latter was much more challenging because the products that were developed did not match existing needs (see subparagraph (b) under Paragraph (B) in Section 5.2.3.3). The risk-uncertainty profiles of the PsO regression opportunities they morphed and formed were unlike those that prevailed prior to the subversion. They would also have dissimilar venture-outcomes involving different *orientations* when exploiting the subverted opportunities. This will be further described in Paragraph (A)(2) in Section 5.3.2.3 and Paragraph (B)(2) in Section 5.3.2.3.

(3). *Analytical generalizability of theoretical replications*

GutHealthCo (the venture-segmenter), and PulseCo and WellnessCo (the venture-subverters) are *theoretical replications* with segmentation and overconfidence biases respectively as *contrasting conditions* yielding predictable results that reinforce the *rigor, analytical generalizability, and external validity* of the notions of the conceptual O-O-P framework. They help to assert the O-O-P framework’s *internal validity* with regard the *root-origin* of an opportunity as the *unifying focus* of not only the *venture-outcome*, but also the *orientations* of ensuing epistemological *processes* when forming venture-opportunities.

In all three cases the conditions, which contrasted with the conceptual O-O-P framework’s explanations and notions, were caused by the *decisions* of the entrepreneurs to *alter* (through market-segmentation or subversion) the *root-origins* of the initial opportunity-prospects and therefore the venture-outcomes to be achieved for the respective segmented and subverted opportunities that were eventually formed. In GutHealthCo’s case, the segmentation decision

was a deliberate one. For PulseCo and WellnessCo, the entrepreneurial decisions to subvert were due to overconfidence bias albeit unconscious to them.

As outlined above, all the contrasting conditions caused by overconfidence biases happened during the phase of epistemological formation process, which involved *designing* the future for the respective constructionist opportunities. The contrasting conditions manifested in two ways.

First, they showed up as *deviations* from the processes conceptualized by the O-O-P framework, resulting in the formation of *non*-constructionist opportunities as *antithetical* self-fulfilling prophecies. With respect to GutHealthCo, the *venture-segmenter*, its entrepreneur's decision as the *contrasting* condition was to *segment* the general demand in existing market for constipation remedies, which was the initial opportunity's MdO root-origin. The entrepreneur *deliberately decided to taper* the focus of her *prospective* MdO opportunity on a *niche segment* instead (see Paragraph (A) in Section 5.2.3.1), and then went on to form MdO *creationist*-opportunity as an eventual derivative, which still kept a market-orientation.

In the case of the two venture-subverters (PulseCo and WellnessCo), the entrepreneurs' overconfidence biases caused the contrasting condition of *subverting* the initial ontological root-origins of market-demand for their initial MdO opportunity-prospects. As outlined above, the *overconfidence biases* in the entrepreneurs' decisions turned 'product' (the instrumental-means) into the end-come for both the startup-ventures (see Paragraph (A) in Section 5.2.3.3). For the two *venture-subverters*, the eventual derivatives were PsO *regression* instead of MdO constructionist opportunities.

The *second* way the contrasting conditions unraveled was reflected in the scope of actions undertaken by the entrepreneurs during the phase of designing the future (within the black dot of the white *yang* area in Step #B of Figure 5.12). As compared to the actions undertaken by the six venture-cases that represented literal replications (see Paragraph (A)(2) in Section 5.3.2.1), the scope of actions implemented by GutHealthCo, PulseCo, and WellnessCo was relatively much narrower upon being realigned from MdO to PsO (see Paragraph (A)(2) in Section 5.3.2.1 for comparison). It encompassed only the following actions:

- (a) Market feasibility analysis, like getting feedbacks, market survey, and research.
- (b) Sales development strategy, such as talking to potential customers.

In summary, MdO *constructionist* opportunities *per se* failed to materialize as *self-fulfilling prophecies* (Caption #1 in Figure 5.12 and Figure 5.12) as they should from the initial MdO *constructionist* opportunity-prospects of GutHealthCo (the venture-segmenter), and also PulseCo and WellnessCo (the venture-subverters). Instead, MdO creation opportunity (Caption #2 in Figure 5.11, and Cell 5 of Quadrant III in Figure 5.9) and PsO regression opportunities (Caption #3 in Figure 5.12, and Cell 3 of Quadrant IV in Figure 5.9) were formed for the venture-segmenter and venture-subverters respectively. This is contrary to the conceptualizations of the O-O-P framework but can be explained by the *contrasting conditions* fathered by *market-segmentation* and *overconfidence biases*.

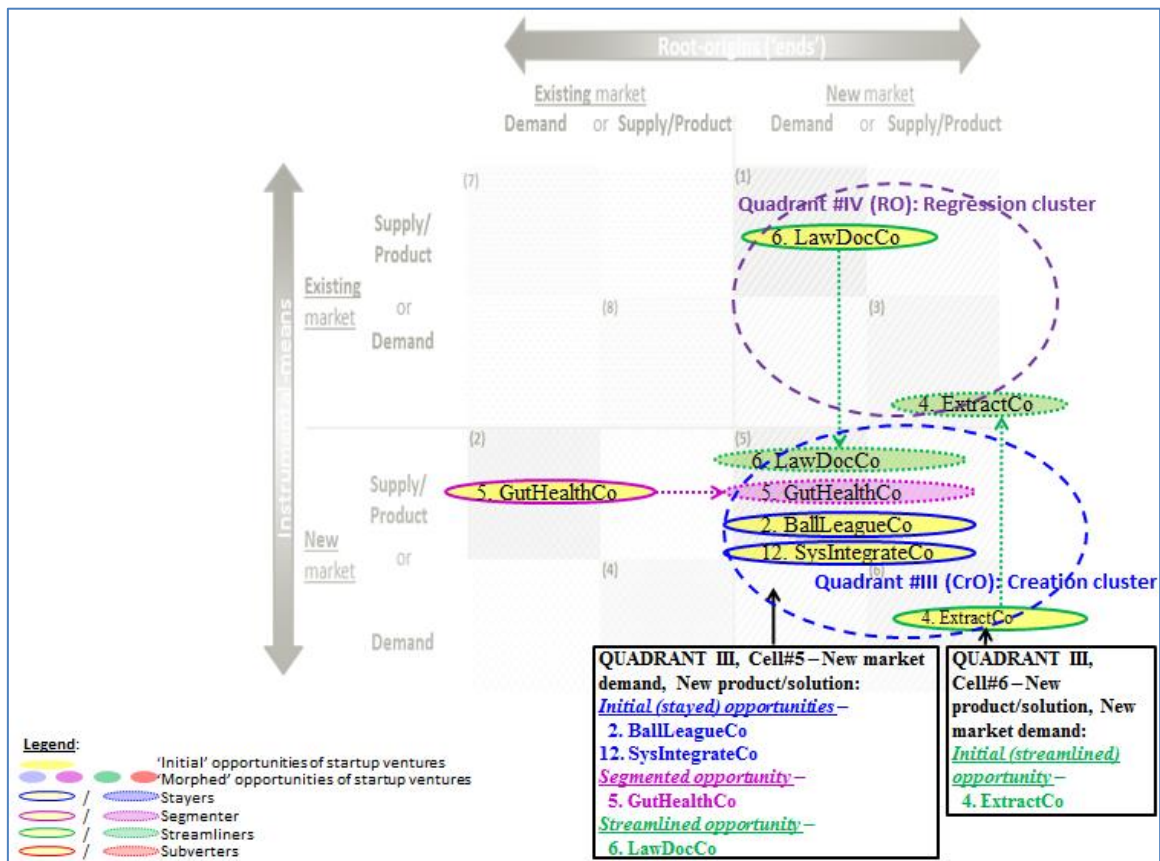
5.3.2.2 Creation (evolutionary-realist) epistemological cluster

As mentioned in Section 5.3.2, there were five creation opportunity-prospects within the *creation* (evolutionary-realist) epistemological cluster (Quadrant III) as Figure 5.13 shows. Four of them were MdO *creation* opportunities of the Cell 5 type in Figure 5.13, of which:

- (a) two (BallLeagueCo and SysIntegrateCo) *initially* started, and *ultimately* formed, as prospective *creationist*-opportunities (see Paragraph (a)(ii)(1) of Section 5.3.2);
- (b) one (GutHealthCo) was a *segmented* derivative of an initial *constructionist* opportunity-prospect (see Paragraph (a)(i)(2) of Section 5.3.2); and
- (c) one (LawDocCo) was *streamlined* from an initial *regressionist* opportunity-prospect (see Paragraph (a)(iii) of Section 5.3.2).

A fifth creation opportunity pursued by ExtractCo started as an *initial* PsO *creation* prospect of the Cell 6 type in Figure 5.13, but it was subsequently *streamlined* into a *regression* opportunity of Cell 3 type in Figure 5.13.

Figure 5.13 – Venture cases with creation opportunities



All the creation opportunities were characteristically *Schumpeterian new combinations* with objective realities in environments that were not initially recognizable, observable, knowable, or detectable by the respective entrepreneurs. The epistemological formation (or coming into being) of creation opportunities entailed the application of *knowledge* and *blind variations* to the evolutionary-realist processes of *social construction*, *social cross-validation* and *selection-retention* of actions by the market, and *continuing social readjustments*. This was true whether the opportunity-prospects started *initially* with a creation nature (as in the case of BallLeagueCo and SysIntegrateCo, and even ExtractCo), or became a creation opportunities through *segmentation* (GutHealthCo) or *streamlining* (LawDocCo).

(A). *Literal replications of creation opportunities*

The findings of this research show that the epistemological formation and evaluation processes/actions of the opportunities for the two venture-stayers, BallLeagueCo and SysIntegrateCo, are *literal replications* of evolutionary-realist tradition for creation opportunities as conceptualized and explained by the O-O-P framework. Figure 5.14's Taijitu below (which has more details than Figure 3.17) provides a visual summary of the evolutionary-realist process for the formation of creation opportunity, which typifies what the two venture-stayers went through in practice as the findings show.

Figure 5.14 – Epistemology of creation opportunity



(1). *Initial creationist-opportunities of venture-stayers*

For BallLeagueCo, the entrepreneur perceived as an *objective reality* the “problem and an unmet need” in the game of basketball for amateurs who might want to relive the meaningful game moments but could not. BallLeagueCo perceived an MdO opportunity-prospect emerging for a new product-solution that captures the game experience by video to be brought as the instrumental-means to meet the perceived market need. The opportunity-prospect had ***Schumpeterian new combination*** characteristics, because of its uniqueness.

“So it’s really like there isn’t really an intersection of what we are doing that has been done before.” (BallLeagueCo)

The entrepreneur recalled the series of MdO *blind variations* BallLeagueCo had to go through during the initial start-up stage (see Step #A in Figure 5.14). He interacted with market leaders to *socially construct* and develop the concept for the opportunity. Low-level research using cold calls was also done which involved gathering a list of potential customers in different markets in order to cross-validate the concept *socially* (Step #B1 in Figure 5.14), and embrace ideas of other people. A *selection-retention* process (Step #C in Figure 5.14) was used to “[put] things out and [having] people responding back,” as the company recognized that “customers have influence in where the product goes.” Customer feedbacks featured prominently throughout the *continuing process of social readjustment* (Step C2 in Figure 5.14) to refine the proposed product-solution and translate the MdO creation opportunity-prospect into a tangible reality (Caption III in Figure 5.14).

“We wanted to get to the point where we had a compelling upsell opportunity to players, and so with time, our end-goal has been about understanding what that might be.”
(BallLeagueCo)

During a long period of infirmity at the hospital, the entrepreneur of SysIntegrateCo sensed (but was unsure) the *objective reality* of the need to provide an improved level of critical medical care for sick patients. He believed that the opportunity was to integrate medical devices with convergent technologies and human physiology solution as the instrumental-means for the

perceived need. He felt that it was a novel idea that never existed before for a yet untested new market and therefore required careful evaluation. It was in a Schumpeterian sense, a new combination involving radical *uncertainties and challenges*:

“I suspected but wasn’t fully convinced that I was going to lose a lot of money by going to this particular area of business. But the point is I was driven by my heart . . . it’s hard to define in such a complicated area what your real goal is.” (SysIntegrateCo)

Making blind variations to construct, evaluate and “observe the opportunities that were really there” (as an objective reality), the entrepreneur conducted *ethnography* of patients, nurses, and doctors in the intensive care units of hospitals (Step #A in Figure 5.14).

To cross-validate the ethnographic findings (Step #B1 in Figure 5.14), SysIntegrateCo’s founder went on trade missions where he met a distributor from Malaysia. What then ensued was the subsequent MdO process of involving customers in *selecting-retaining* (Step #C1 in Figure 5.14) the functional features of the product being developed. The final IT solution matrix for hospitals was thus the result of *continuing social readjustments* (Step #C2 in Figure 5.14), culminating in the MdO opportunity being formed and created (Caption #III in Figure 5.14), with a potential market value of NZ\$50 million.

“We kept drilling down and drilling down, and understanding what the users want, and how they work, and what they needed. And suddenly, boof . . . hey guess what, you just save that nurse an hour’s work every day. And that’s pretty big payback.”

(SysIntegrateCo)

(2). Analytical generalizability of literal replications

The empirical findings as described above on the formation and evaluation processes and actions undertaken by the two *venture-stayers* for their initial MdO creation opportunities demonstrate *literal replications*, which accord with the evolutionary-realist epistemology for *creation* opportunities as conceptualized and explained by the O-O-P framework. The Schumpeterian new combinations, which the venture-stayers formed as creation opportunities, were objective realities that needed a repertoire of interactive actions to manifest, and make recognizable and

knowable. Rather than being discrete, the actions involved in the opportunity-formation process typically overlap with each other, and often happen contiguously (Low & MacMillan, 1988). Empirical findings show the presence of *representativeness bias* (Busenitz & Barney, 1997), or the willingness to generalize from small samples (Alvarez, et al., 2010), in the entrepreneurs' decision-making and actions under uncertainty to 'effectuate' the creation opportunities with resources at hand (Baker & Nelson, 2005; Sarasvathy, 2001). The processes and actions involve:

- (a) Market feasibility analysis, such as low-level research to provide a quick overview on the feasibility of the prospective opportunity, feedbacks, and interactions with potential customers, and fact-finding trade missions.
- (b) Sales development strategies, like ethnography.

The opportunity-formation process was characterized by blind variations, social constructions, and social cross-validation by the market (Steps #A and #B1 in Figure 5.14). They were selected for and against by the market as part of the continuing process of social readjustments as the O-O-P framework conceptualized (Steps #C1 and #C2 in Figure 5.14). Taken collectively, they helped the venture-stayers to form the creation opportunities and make their existences 'apparent,' observable, knowable, and detectable over time, as finally represented by the white *yang* observable tadpole area of the Taijitu (Caption III in Figure 5.14).

As research findings also show, **these epistemological processes and actions taken to form a creation opportunity are oriented by the root-origin that triggered the opportunity-prospect**. Indeed, the formation of these new creation opportunities that started with blind variations may necessitate the rejection of what the creation entrepreneurs previously knew, or currently know in regard what is still unknown, unobservable, and undetectable, and therefore become knowable only with time (Alvarez, et al., 2010, p. 36). For both the venture-stayers, blind variations led to new understanding of *what* their market demand could be, and *how* things could be done. Their product-solutions represented new and distinctive aggregation of "a cumulative series of interrelated acts of variation, selection, and retention" (Alvarez, et al., 2010, p. 36). As the emergent creation process unfolded in both cases, their products as the instrumental-means to fulfill the MdO creation opportunities often require innovative actions.

“These opportunities often require the development of new resources, commitments, routines, networks, and societal norms that are distinctly different than what was previously accepted.” (Alvarez, et al., 2010, p. 36).

(B). Theoretical replications – Venture-segmenter and venture-streamliner

GutHealthCo and LawDocCo are *theoretical replications*, demonstrating that *initial* opportunity-prospects segmented and streamlined from constructionist and regression origins respectively can still be formed into *creation* opportunities. ExtractCo as the third startup-venture also serves as a *theoretical replication* to illustrate that an *initial* opportunity-prospect of *creation* origin may still *fail* to become a creation opportunity.

(1). Creation opportunity segmented from initial constructionist opportunity-prospect

As we learned in Paragraph (B)(1) of Section 5.3.2.1 above, GutHealthCo *narrowed* the *root-origin* of its *initial* MdO constructionist opportunity-prospect to *focus* on a brand new *segment* of the wider market for constipation remedies. The *new focus* thus changed the opportunity’s ontology from being the Cell 2 type in Quadrant II to the Cell 5 type in Quadrant IV of the opportunity-hexadecadrant (see Figure 5.4 and Figure 5.9), keeping the *new* venture-outcome as MdO but aligned to bring a *new*, re-designed kiwi-fruit *product* to the *niche* IBS⁵⁵ market which is the *new root-origin*. The reconfigured plan bore the novelty of a Schumpeterian new combination.

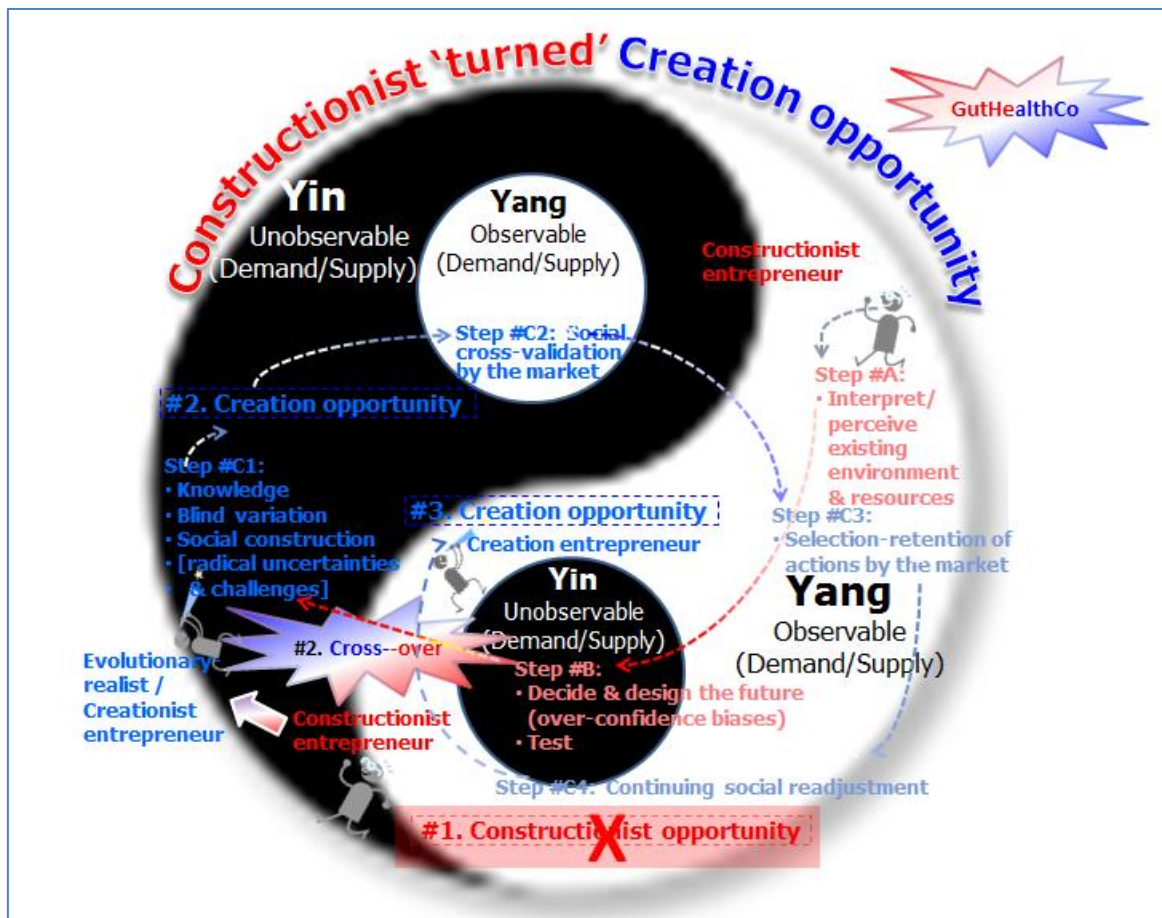
“So we don’t compete with all the other product – we grew the category . . . nobody else had tried to do kiwi-fruit like that.” (GutHealthCo)

In line with the ontological change, GutHealthCo (*re*)oriented the opportunity-formation process, deviating at the ‘*designing the future*’ phase of the *constructionist* processes (Caption “#B” in Figure 5.15), and crossing over into formation processes that had a *creation* epistemological tradition (Caption “#2” in Figure 5.15). GutHealthCo’s new mission to (*re*)form its opportunity-

⁵⁵ IBS is an acronym for “irritable bowel syndrome.”

prospect with the new MdO venture-outcome involved a new environment with different uncertainties and challenges that were more radical as represented by the black *yin* (unobservable) tadpole area of the Taijitu in Figure 5.15.

Figure 5.15 – GutHealthCo: Transitioning into creationist epistemological formation from constructionist



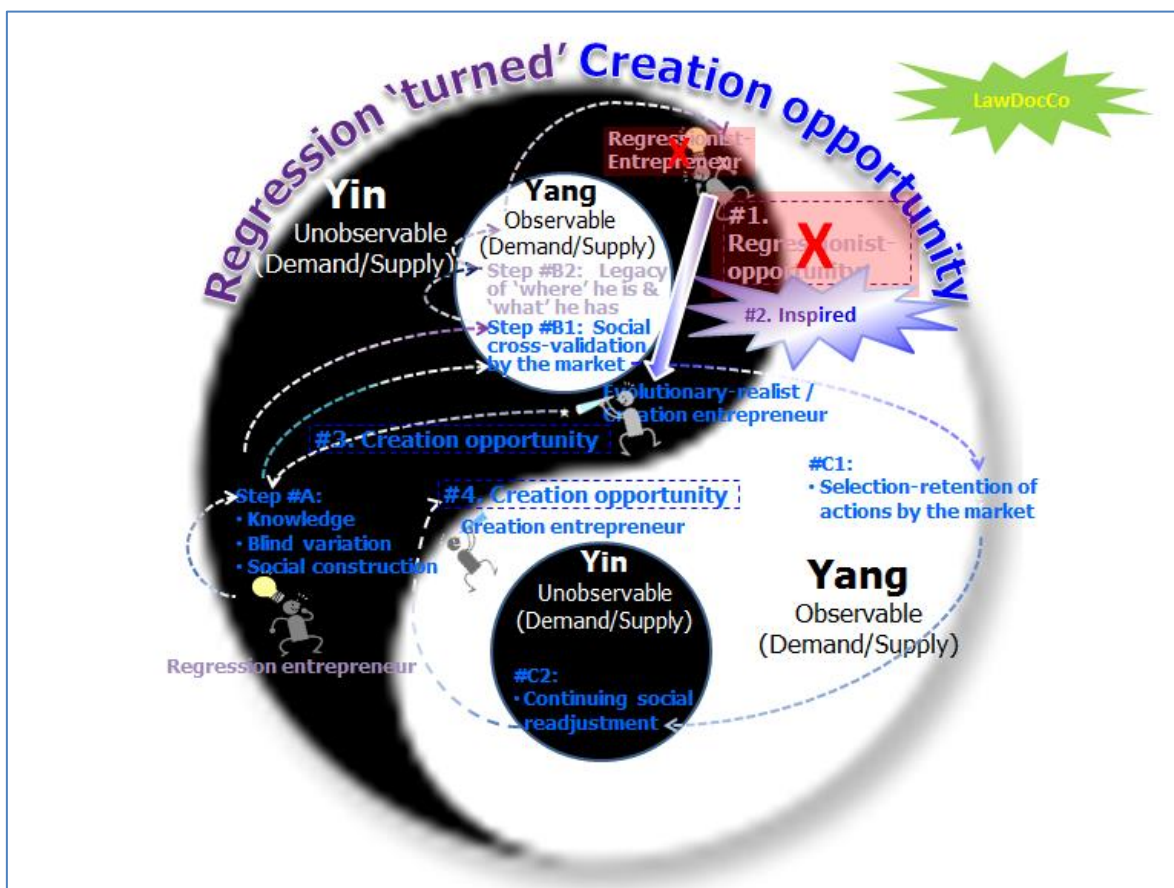
In developing the new product, the entrepreneur had to pull together her scientific *knowledge* to overcome *blind variations* (Step #C1 in Figure 5.15). The product also needed to be *socially validated* (Step #C2) against third-party patents and regulatory requirements. Product development was also *selected for and against* (Step #C3) by a *continuing social readjustment process* (Step #C4) involving consumer surveys. These MdO developmental efforts evolved and continued for six months. Animal and clinical trials were the main *evaluation* tools to prove that the product worked for the creation opportunity that was finally *formed* (refer to Caption #3).

“[The] marketing manager . . . go out and do consumer surveys, talk to all the pharmacies, and . . . he just keep[s] coming back with information, and we just kept designing the product until we had what the consumer wanted.” (GutHealthCo)

(2). Creation opportunity streamlined from initial regression opportunity-prospect

LawDocCo’s entrepreneur is a serial entrepreneur who always wanted to try out something on his own. Like his GutHealthCo counterpart, he did not have a product in mind nor any sense of what demand he would meet, or the market he would serve. He scoped the market *blindly* (Step #A in Figure 5.16), speaking to over 100 different professionals.

Figure 5.16 – LawDocCo: Transitioning into creation epistemological formation from regression



He managed to *socially construct* and *socially validate* (Step #B1) document storage as an area needed by lawyer. Once the need was identified as an *objective reality*, he deferred to *whatever resources* he had (in terms of knowledge) by fixating on the experience that he had gathered from the *legacy environment* of project management and business development *where* he had worked as a civil engineer (Step #B2). He chose DropboxTM, an existing solution in the market, as the instrumental-means to meet the unfilled needs of the legal profession. LawDocCo's opportunity-prospect was therefore on track to become an MdO *regression* opportunity.

However, as the entrepreneur started down the path, he found that the *prospective* MdO regression opportunity would only serve the problems of small legal firms. The entrepreneur *evaluated* that the financial returns did not justify the costs of pursuing the opportunity-prospect, and decided not to progress further with the *regression* epistemological formation process. The prospect *did not form* into a regression opportunity (Caption #1 aborted).

In the meantime, LawDocCo's prospective customers expressed a more pressing need from new rules in the legal profession to track the learning and professional development of staff. There was no solution available. LawDocCo then did a survey, which confirmed that it was "a real problem." Feeling *inspired*, LawDocCo headed in the new direction (Caption #2). Over a three-month period, it engaged in conversations with a number of firms to *socially construct and cross-validate* (Steps #A and #B1) an innovative, smart, and efficient compliance solution that he proposed to provide. Using different mockups, the process of *selection-retention* and *continuing social readjustment* of product functionalities by potential market-users ensued (Steps #C1 and #C2). It helped to refine, polish, and *streamline* the product idea, as well as to 'flush out' the creation opportunity and make it more *observable* in the white *yang* tadpole area of the Taijitu (Caption #4). Thus, the new *creation* opportunity remained MdO in nature (see also Table 5.3) and had all the characteristics of a Schumpeterian new combination that involved the venture-outcome of bringing an innovative *new* product to a *new* market need (the root-origin of its opportunity).

"So it was very much driven by the demand of the [new] market rather than product first." (LawDocCo)

Using the opportunity-hexadecadrant to summarize, the *refocusing* on a new market need required the streamlining of a new and innovative solution. It changed the opportunity's ontology so that what started as a prospective MdO regression opportunity in Cell 1 of Quadrant IV finally ended up becoming a *creation* opportunity in Cell 5 of Quadrant III (see Figure 5.13).

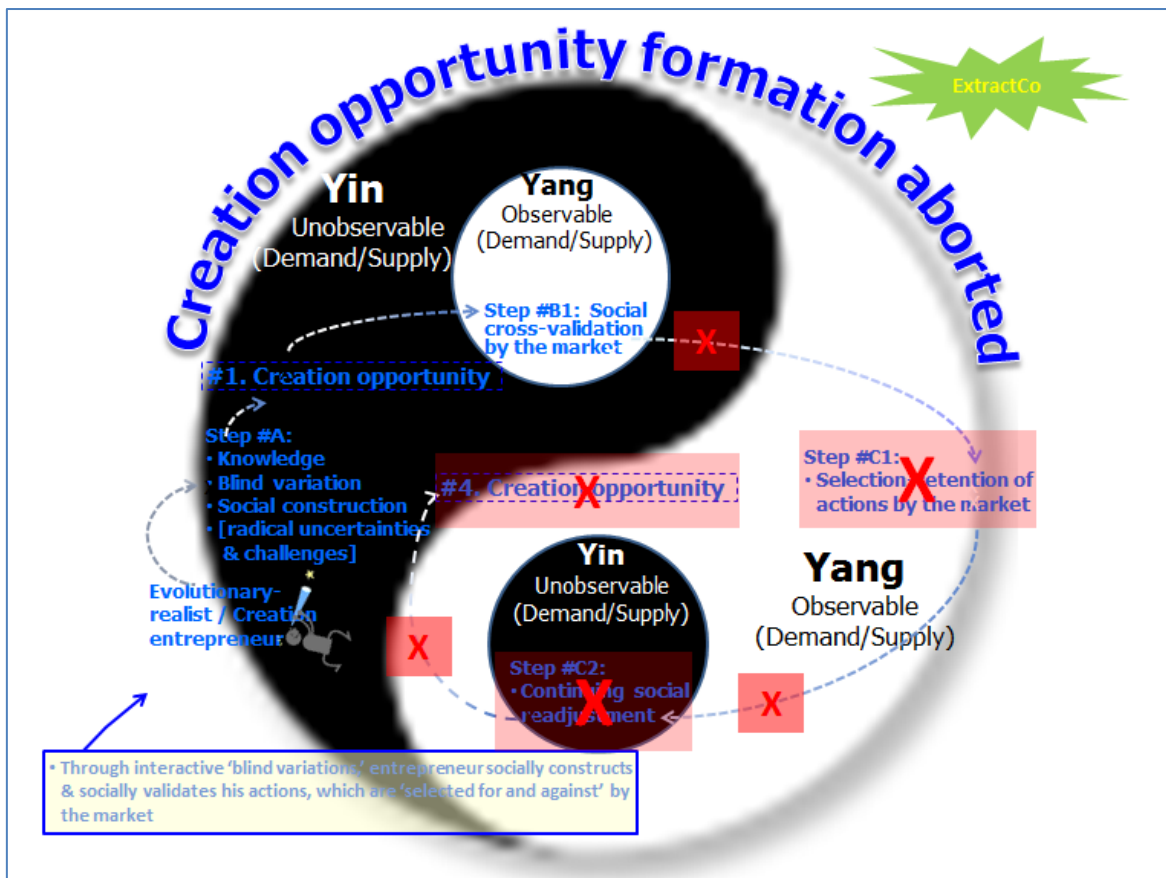
(3). *Initial creation opportunity-prospect streamlined into regression opportunity*

ExtractCo was the *only one* that started with an initial creation opportunity-prospect of a *PsO* ontological nature. It was subsequently *streamlined* and formed into a *PsO* regression opportunity. At the start, the root-origin of ExtractCo's initial opportunity-prospect was triggered on the supply-side. The idea was to capitalize on the three founders' exclusive "access to all of New Zealand extracts [which] *nobody* else did," which they wanted to leverage and "*create products* and get money back." However, there were radical *uncertainties* as to what product to create and what the nature of the market was going to be. The *prospective* opportunity was therefore creation in nature, as represented by Cell 6 of Quadrant III in Figure 5.13. In their minds, they were embarking on a venture to pursue the opportunity of creating a new product for a new market, which was unknown and unobservable to them (Caption #1 in the black yin tadpole area of Figure 5.17).

"We thought if we created [the product], the market will come." (ExtractCo, see also Table 5.1)

Through interactive *blind variations*, the founders tried to socially construct, socially cross-validate, and form their vision into a formal opportunity (Steps #A and #B1 in Figure 5.17). For instance, even though the market was unbeknown to exist, the founders had to strategize how to put together their unique skills and expert *knowledge* in plant science, medical science, microbiology, molecular biology, and entomology, "to create *something* that [the market] *would want*". They finally settled on the plan to create an innovative high throughput platform to screen all the natural plants in New Zealand, make extracts, and then on-sell them as materials for herbicides, pesticides, and fungicides. The founders then worked out how to do the screening platform cheaply before hopping on the plane to attend a conference and solicit prospective clients.

Figure 5.17 – ExtractCo: Aborting creation epistemological formation to transition into regression



As events turned out however, the founders *did not progress* with the *subsequent selection-retention* epistemological tradition of creation opportunity by involving prospective customers at the conference to *distill* their blind variations (i.e., Step #C1 in Figure 5.17 was aborted). The process of *social readjustment* (Step #C2) was also aborted so that the PsO creation opportunity (Caption #1) of creating and bringing a *new* market as the instrumental-means for the innovative platform-solution as the venture outcome did not materialize (i.e., Caption #4 was aborted).

At the conference, ExtractCo's founders learnt that a ready market for plant extracts existed. The knowledge of an *existing* market environment being an *objective reality* came because of the *social construction* and *social cross-validation* processes that happened at the conference *where they were*. Once the objective reality became *observable* and known to the founders (Step #B1 in

the white yang dot of Figure 5.17), they decided to follow the easier path of generating business for the platform-solution as soon as possible.

“We went to that conference, we had no money, and we basically faked that we had [the product] all in place. We had part of it in place but we basically bluffed our way to [the big agricultural company], and they offered us a contract and . . . so the contract shaped what we did next.” (ExtractCo)

In effect, what ExtractCo did next was to *regress* and *streamline* the ontological nature of the initial PsO creation opportunity-prospect (Cell 6 of Quadrant III in Figure 5.13) into a PsO *regression* type of opportunity (Cell 3 of Quadrant IV). It then meant that ExtractCo needed only to achieve a PsO venture outcome of bringing existing/*legacy demand* from the existing market as the instrumental-means for the extracts that it planned to make (which was the initial PsO root-origin). In other words, the founders felt contented once they secured a business contract from the global agribusiness company (Step #B2 in Figure 5.20), and decided to pursue a PsO regression opportunity (Caption #2 in Figure 5.20) even though it was devoid of the radical novelty that was present in the initial PsO creation opportunity-prospect.

(4). Analytical generalizability of theoretical replications

The empirical findings reveal GutHealthCo and LawDocCo as *theoretical replications*. They demonstrate that opportunity-prospects with *initial constructionist* and *regression* ontological origins *can be formed* as *creation* opportunities (evolving characteristic of yin-yang dynamic duality tenet), if either the segmentation of the root-origin or streamlining of the instrumental-means qualify them as the kind of new combination that Schumpeter described. The *initial* opportunity-prospects of these two startup-ventures did not begin with evolutionary-realist tendencies. Nevertheless, they ‘moved up a notch’ into the realm of Schumpeterian new combinations when GutHealthCo and LawDocCo deliberately decided to elevate the level of novelty involved. In GutHealthCo’s instance, rather than serving an existing market, it decided to bring a new kiwi-fruit product for IBS treatment, a new niche that existed but not carved as a separate *segment* (or subset) in the existing market. For LawDocCo, the decision was to introduce a brand new product-solution for the new need that had emerged from new government

regulations to track professional development of company staff. For both the startup-ventures, the segmentation and streamlining created uncertainties and challenges that were much more radical, and propelled them into the realm of evolutionary-realist epistemological process for opportunity formation, which their venture-stayer counterparts (i.e., BallLeagueCo and SysIntegrateCo) also followed when shaping their respective initial MdO opportunity-*prospects* into creation opportunities. The epistemological processes and actions were identical to the explanations of the conceptual O-O-P framework for the formation of creation opportunities.

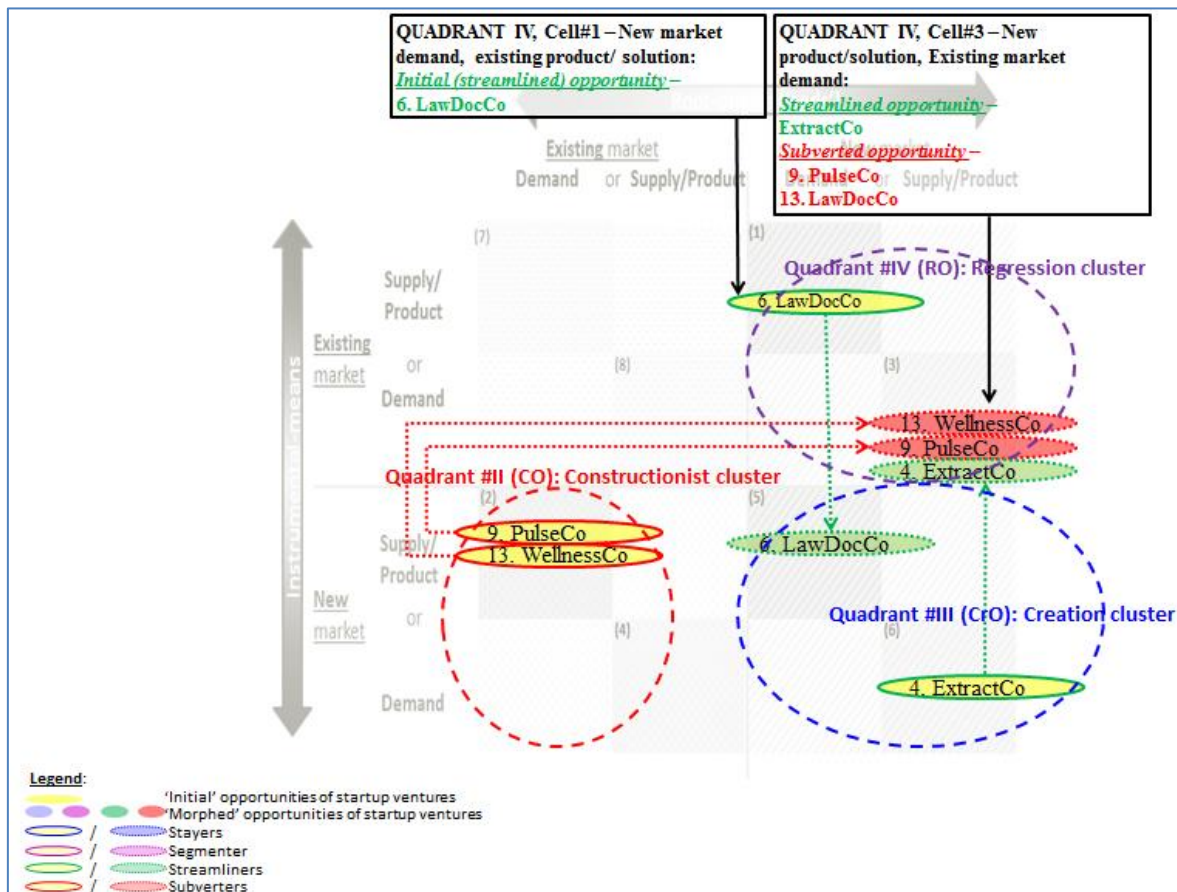
The third venture, ExtractCo, also serves as a *theoretical replication*. It illustrated how an *initial* opportunity-prospect that was *creation* in nature *failed* to form as an eventual *creation* opportunity. The reason lies in the entrepreneurial *decision* to *downgrade* and *streamline* the *novelty* of the *instrumental-means* taken to fulfill the root-origin of the opportunity. Rather than creating and bringing a new demand for its platform-solution, ExtractCo took the ‘less creative’ option of bringing *existing* demand instead. Therefore, by resigning from the creative realm of Schumpeterian new combination, ExtractCo did not undertake the further actions of selection-retention, or continue with socially readjusting and refining the process of opportunity-formation. Tempted by the business contract from a global agribusiness company, a clearly recognizable objective reality, ExtractCo simply aborted its original plans and instead formed an opportunity with a regression ontological nature. The subsequent evolutionary-realist process for the otherwise creation opportunity became *redundant*. Hence, ExtractCo’s decision to *streamline* or change the instrumental-means into a less creative option is a *contrasting condition* to the notion conceptualized by the conceptual O-O-P framework for the formation of creation opportunity.

5.3.2.3 Regression epistemological cluster

As mentioned in Paragraphs (a)(i)(3), (a)(ii)(2), and (a)(iii) of Section 5.3.2, there are four opportunity-prospects within the *regression* epistemological cluster in Quadrant IV as Figure 5.18 shows. LawDocCo (a venture-streamliner) was the *only one* that started as an *initial* MdO regression opportunity-*prospect* (Cell 1 in Quadrant IV of Figure 5.18), although it was subsequently streamlined and formed into an MdO creation opportunity (Cell 5 in Quadrant III

of Figure 5.18). The other three (PulseCo, WellnessCo, and ExtractCo) which ended up with PsO regression opportunities had *non-regression* opportunity-prospects when they first started.

Figure 5.18 – Venture cases with regression opportunities



As alluded to in Paragraph (B)(2) of Section 5.3.2.1 above, the eventual PsO regression opportunities (Cell 3 in Quadrant IV of Figure 5.18) of the two venture-subverters (i.e., PulseCo and WellnessCo) were *subverted* derivatives of MdO opportunity-prospects with initial *constructionist* beginnings (Cell 2 in Quadrant II). ExtractCo (a venture-streamliner like LawDocCo) began as a PsO creation opportunity-prospect (Cell 6 in quadrant III) before being streamlined and formed into a PsO *regression* opportunity (Cell 3 in Quadrant IV of Figure 5.18).

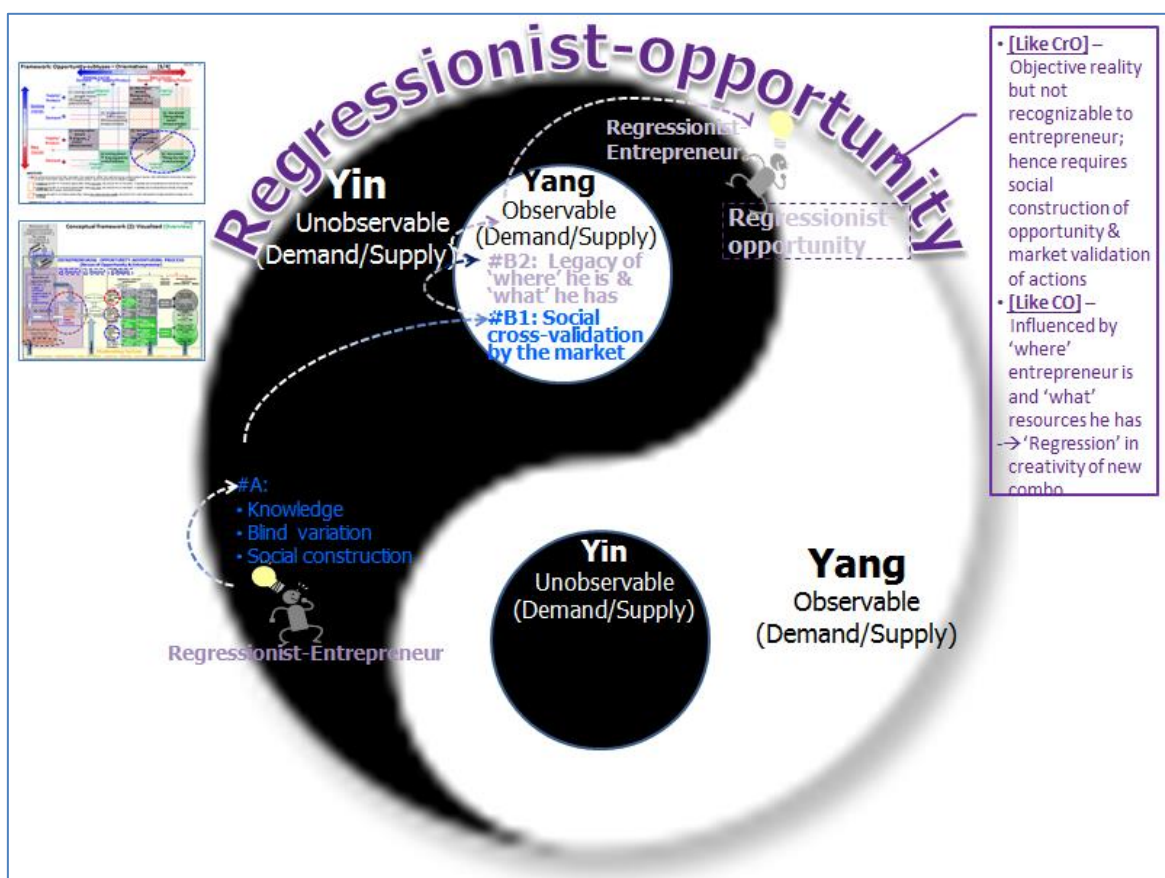
Research findings show that these four venture-cases provide the bases for *literal replications* and *theoretical replications* of the epistemology for *regression* opportunities as conceptualized

by the O-O-P framework. Coincidentally, the literal replications comprised a venture-streamliner (ExtractCo) and a venture-subverter (PulseCo); the theoretical replications also consisted of a venture-streamliner (LawDocCo) and a venture-subverter (WellnessCo).

(A). *Literal replications of regressionist opportunities*

ExtractCo (a venture-streamliner) and PulseCo (a venture-subverter) are literal replications of the regressionist epistemological formation process after they decided to streamline and subvert their initial *creation* and *constructionist* opportunity-prospects respectively. Figure 5.19's Taijitu below (which has more details than Figure 3.18) provides a visual summary of the epistemological process, which exemplifies how *regression* opportunity is formed in practice.

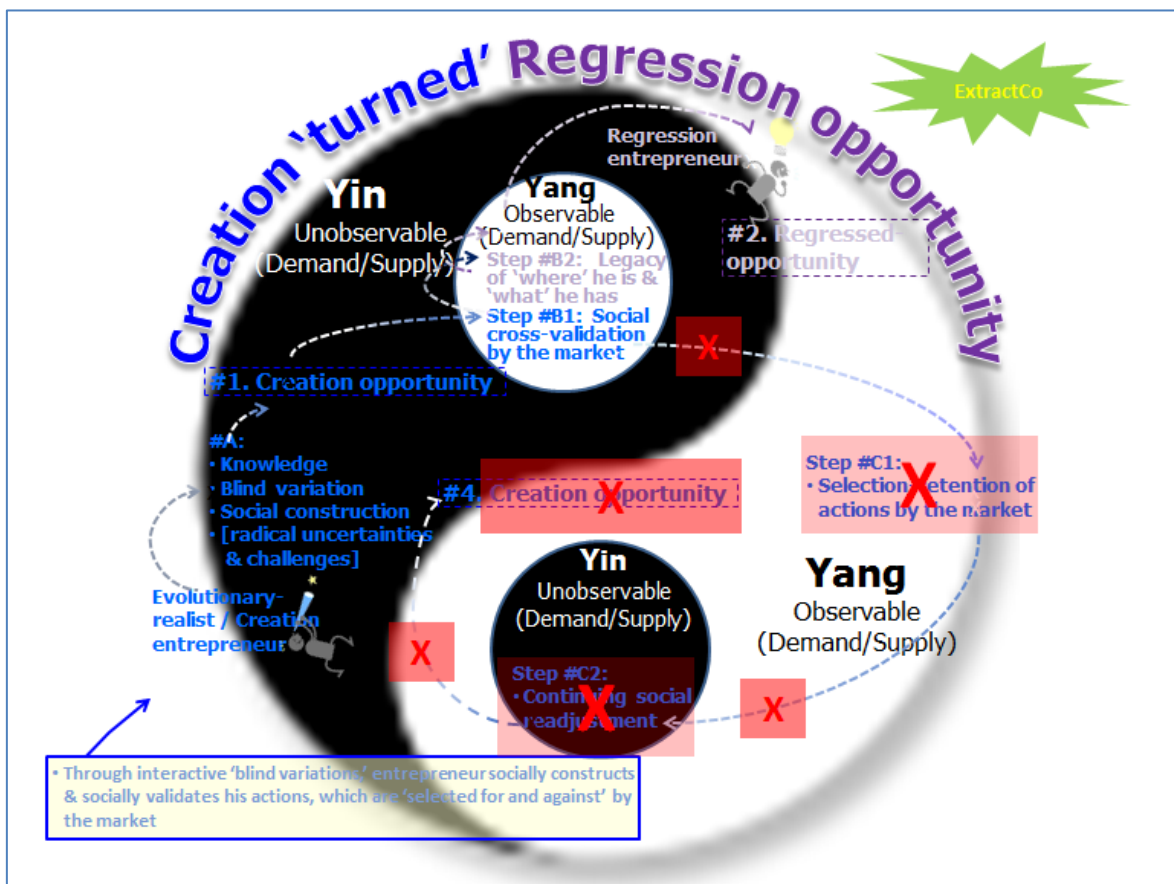
Figure 5.19 – Epistemology of regression opportunity



(1). Initial creation opportunity-prospect streamlined into regression opportunity

As detailed in Paragraph (B)(3) of Section 5.3.2.2, ExtractCo secured a business contract and decided not to progress with the *subsequent* evolutionary-realist epistemological processes of *selection-retention* and *continuing social readjustment* to formalize its initial opportunity-prospect into a *creation* opportunity (i.e., Steps #C1, #C2, and Caption #1 in Figure 5.20 were aborted). Instead, it decided to pursue the easier path of bringing the existing needs of a global agribusiness company as the instrumental-means for the new platform-solution that it innovated, thereby forming a PsO regression opportunity (Steps #B1 and #B2, and Caption #2 in Figure 5.20).

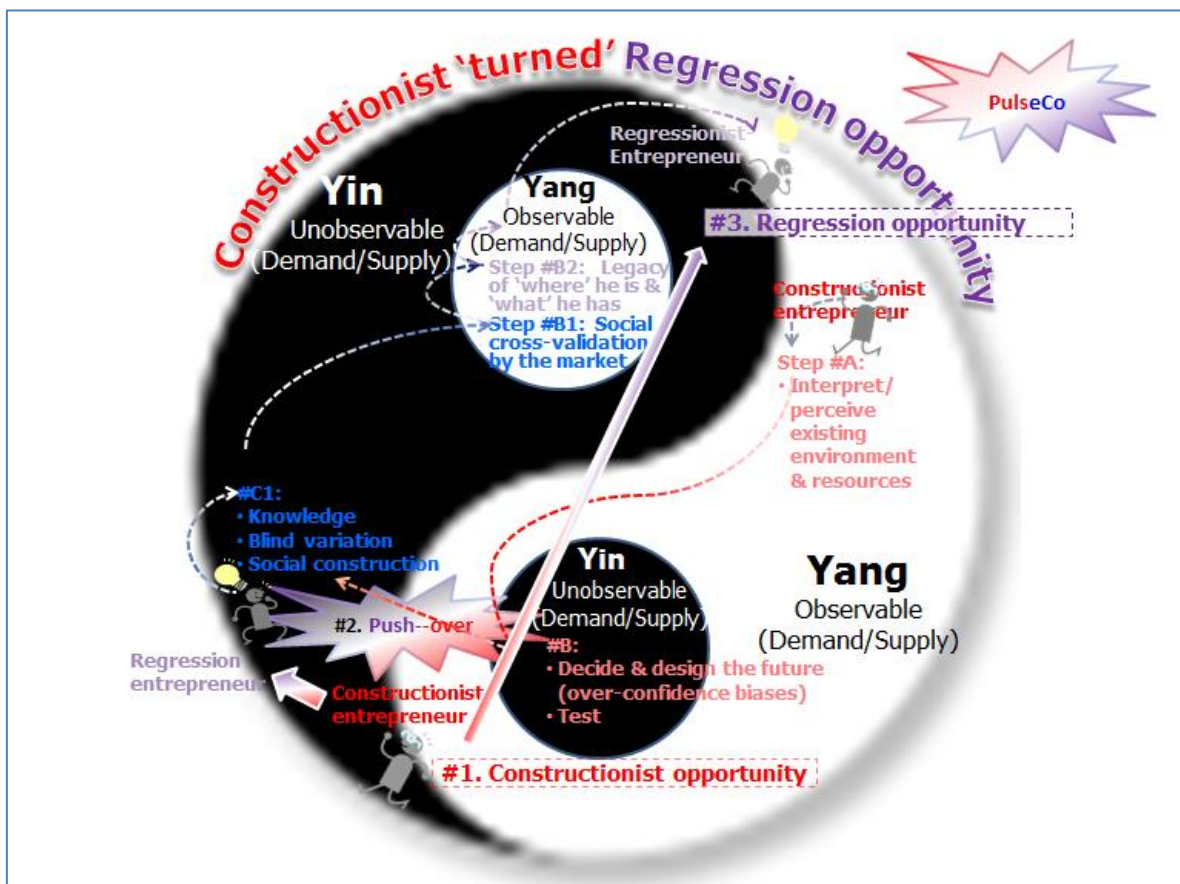
Figure 5.20 – ExtractCo: Transitioning into regression epistemological formation (from creation)



(2). Initial constructionist opportunity inverted into regression opportunity

Paragraph (B)(2) of Section 5.3.2.1 described how overconfidence bias manifesting as overestimation disoriented PulseCo, causing it to subvert the initial MdO root-origin with the PsO instrumental-means. The latter thus became the *quasi root-origin*, which is also the isomorphic *quasi venture-outcome* (or ends) for the subverted opportunity. The subsequent epistemological process that PulseCo followed was thus *deviated* from MdO constructionist (Cell 2 in Quadrant IV of Figure 5.18) and *reoriented* to PsO regression (Cell 3 in Quadrant IV of Figure 5.18), with the PsO venture-outcome of bringing the existing demand to the medical device that it was innovating (Caption #2 of Figure 5.21).

Figure 5.21 – PulseCo: Transitioning into regressionist epistemological formation (from constructionist)



Symptomatic of the ‘cross-over ‘into a regression epistemological tradition (the black tadpole area of Figure 5.21), PulseCo began a series of *social construction* and *social cross-validation attempts* (Steps #C1 and #B1 in Figure 5.21). PulseCo was ‘blind’ to customer needs. It relied on *legacy* (see Step #B2 in Figure 5.21) in terms of the medical industry *where* the co-founders had been operating to focus on product development. PulseCo also tried to bring *whatever* existing relationships the co-founders had with hospitals and medical device companies as the instrumental-means to offtake its new product. The eventual outcome was the formation of the PsO regression opportunity (Caption #3 in Figure 5.21).

“[T]he thing that we were doing was trying to get doctors interested so that we could do research more than selling them a product . . . What we didn’t know was the more detailed specifications.” (PulseCo)

(3). Analytical generalizability of literal replications

The findings of this research show that the formation process and actions of ExtractCo (the venture-streamliner) and PulseCo (the venture-subverter) are ***literal replications*** of the epistemology for *regressionist*-opportunities as the conceptual O-O-P framework has explained. In both instances, the reliance on ‘legacy’ as a ‘final’ step to the preceding processes of socially constructing and socially cross-validating blind variations accord with the epistemological tradition conceptualized for the formation of a regression opportunity by the conceptual O-O-P framework.

(B). Theoretical replications of regression opportunities

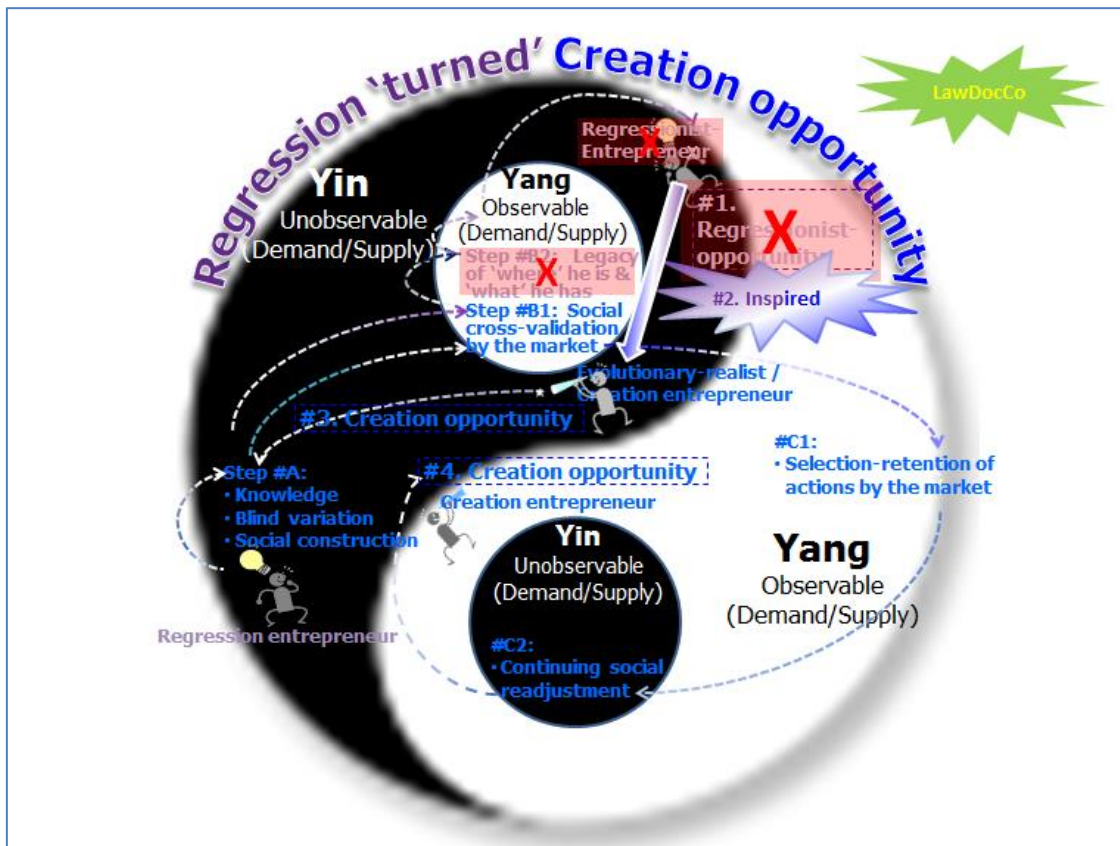
LawDocCo (a venture-streamliner) and WellnessCo (a venture-subverter) are theoretical replications. These two companies had decided to streamline and subvert their initial *regression* and *constructionist* opportunity-prospects respectively. Hence, they provide the condition that contrast with those explained by the O-O-P framework for regression opportunities. In the case of LawDocCo, it started out initially with regression opportunities but later decided to morph it

into the creation type. Conversely, WellnessCo ended with a regression opportunity, which began as a constructionist type.

(1). *Initial regression opportunity-prospect streamlined into constructionist opportunity*

LawDocCo (a venture-streamliner) started initially with an MdO *regression* opportunity (Cell 1 in Quadrant IV of Figure 5.18) that was subsequently streamlined and formed into an MdO *creation* opportunity (Cell 5 in Quadrant III of Figure 5.18). As explained in Paragraph (B)(2) of Section 5.3.2.2, the transformation or *metamorphosis* happened because LawDocCo evaluated as uneconomical the prospects of bringing Dropbox™ (an existing product) as the instrumental-means to meet the unfilled document-storage needs of new clients. It therefore decided to abort the ongoing epistemological processes, which if continued would have led to the formation of the initial prospect into a regression opportunity (Caption “#1” aborted in Figure 5.22).

Figure 5.22 – LawDocCo: Transitioning into creation epistemological formation (from regression)



However, LawDocCo was inspired (Caption #2 in Figure 5.22) by a *new* opportunity-prospect that it found while engaging in the processes of blind variations, and *socially constructing* and *socially cross validating* the initial opportunity-prospect with potential new clients (Steps #A and #B1 in Figure 5.22). Rather than being constrained by the legacy of the founder's past experience and resources, which framed his perception of the scope of the initial opportunity-prospect (i.e. Step #B2 in Figure 5.22 aborted), LawDocCo decided to leverage on the inspiration and extend itself into the processes of selection-retention and continuing social readjustment (see Steps #C1 and #C2 in Figure 5.16). These processes characterize the evolutionary-realist tradition for creation opportunities (see Caption "#3" in Figure 5.22). The objective was to streamline the instrumental-means into something new for the opportunity of serving the *new* market demand. Thus, the regression opportunity that was expected for the initial opportunity-prospect *failed to materialize* (Caption #1 in Figure 5.22 aborted) and a *creation* opportunity was formed in its stead (Caption "#4" in Figure 5.16).

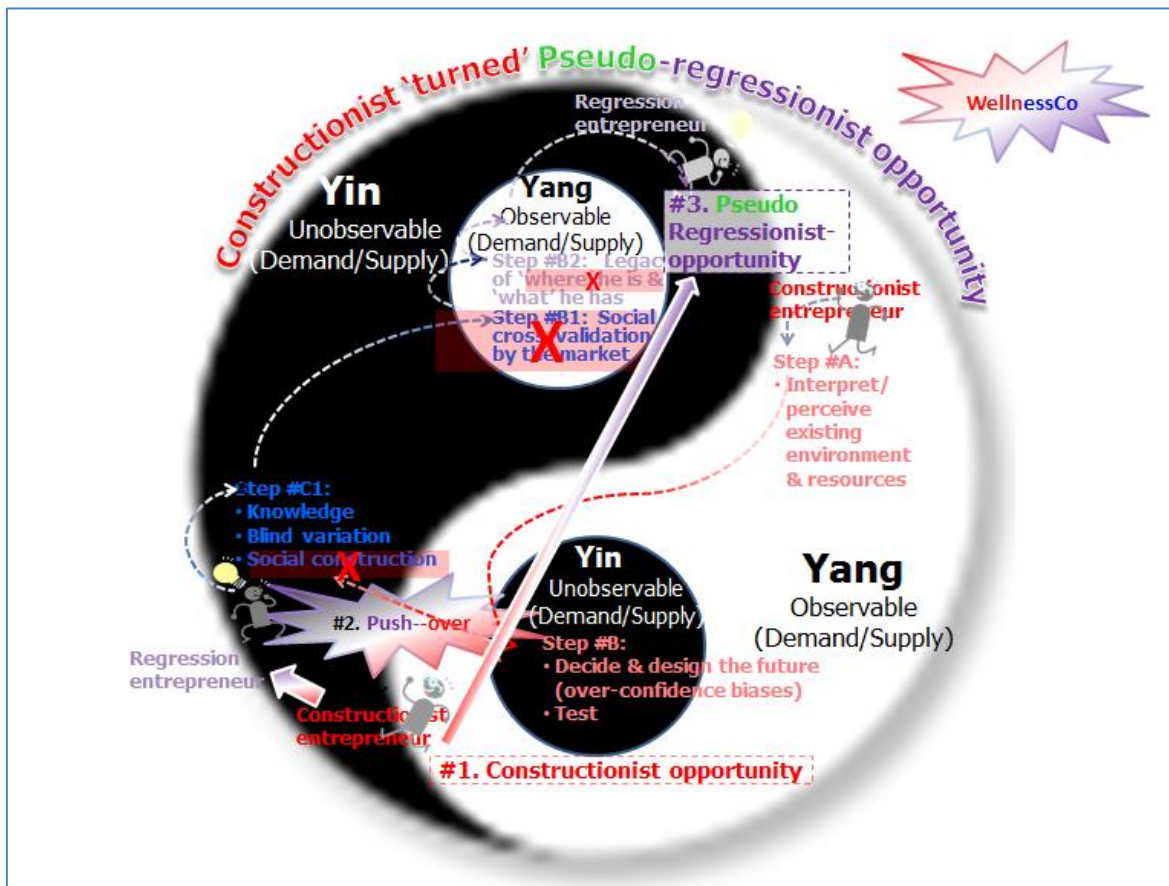
(2). *Initial constructionist opportunity inverted into regression opportunity*

As we learnt in Paragraph (B)(2) of Section 5.3.2.1, overconfidence bias in the form of *overprecision* 'pushed' WellnessCo's entrepreneur to subvert the root-origin (demand) of his initial MdO constructionist opportunity-prospect with the instrumental-means (product) as the quasi root-origin (Caption #2 of Figure 5.23 below). The latter should then define the *venture-outcome* and the orientation of his effort to (*re*)form the initial MdO constructionist opportunity-prospect into a PsO regression type of opportunity. It would have necessitated the bringing of existing market-demand to the new product (Cell 3 of Figure 5.18). However, the entrepreneur commenced building a 'nice to have' product and then try to sell it to the market without social construction (i.e., part of Step #C1 of Figure 5.23 aborted) and social validations (Step #B1 of Figure 5.23 aborted). The entrepreneur therefore did not attempt to address the uncertainties and challenges associated with forming a PsO regression opportunity, which differed from an MdO constructionist opportunity. He *did not evaluate* the feasibility of the PsO regression opportunity that he was forming. WellnessCo's entrepreneur was, in a sense, quite 'blind' (Step #C1 of Figure 5.23), due to overly high *overconfidence* (Pallier, et al., 2002). He thought that bringing the existing market to his eventual product would be easy. He did not even bother to leverage on

the *legacy* of *where* he had been (in terms of his association with friends in the health and wellness industry) to elicit user-needs (part of Step #B2).

“[I did not try to] understand what problems the market has and then build a product in response to that.” (WellnessCo)

Figure 5.23 – WellnessCo: Transitioning from constructionist to regression, then into ‘pseudo’ epistemological formation



The only thing that WellnessCo’s founder did was to rely on the limited personal funding resources he had to perfect development and completion of his innovative product-solution (Step #B2 of Figure 5.23). In short, he *did not fully* follow or appreciate the epistemological process for forming a PsO regression opportunity, such as *social construction* and *social cross-validation* (Steps #C1, #B1, and #B2 of Figure 5.23), which would have provided him with a ‘side’ evaluation of the new product being developed. The entrepreneur’s overconfidence bias was the

contrasting condition that caused WellnessCo to deviate from and breach the epistemological formation processes of the regression tradition. Thus, what ExtractCo ended up with was a *pseudo*-regression opportunity (Caption #3 of Figure 5.23), in the sense that PsO regression opportunity was ‘poorly formed’ with only one of the two dualistic elements that comprise the opportunity nexus. Specifically, the pseudo-regression opportunity had only an innovative product, which was the instrumental-means inverted into the role of quasi root-origin. ExtractCo’s pseudo-opportunity lacked the other dualistic element – market demand. It was therefore ‘incomplete’ and in breach of the holistic duality tenet of the yin-yang concept. It *failed to eventuate* as a full-fledged PsO regression opportunity (Caption #3 of Figure 5.23) that the O-O-P framework conceptualized.

Even though the pseudo-opportunity was not completely formed into a typical regression opportunity *per se*, the findings show that ExtractCo decided to exploit it *regardless*. As we shall see in Paragraph (3) of Section 5.4.2.2, the consequences were disastrous. The macro economic environment had deteriorated by then, and the company ran short of financial resources. WellnessCo finally failed as a startup-venture. It never did extricate itself from the black *yin* (unobservable) tadpole area of the Taijitu where it was mired. WellnessCo incurred cost overruns in building a new product that the customers felt was “nice to have” but not “must have.”

“[T]he lesson for me was don’t build a product and then try to push it down the throat of the market, but understand what problems the market has and then build a product in response to that.” (WellnessCo)

(3). Analytical generalizability of theoretical replications

The four cases (ExtractCo, PulseCo, LawDocCo, and WellnessCo) provide literal and theoretical replications for the *analytical generalizability* of the conceptual O-O-P framework. ExtractCo and PulseCo show epistemological formation processes for regression opportunities that are similar to the conceptual O-O-P framework’s explanations. LawDocCo and WellnessCo reveal regression epistemological processes that *contrasted* with the conceptual framework’s explanations because of the entrepreneurs’ deliberate decisions. In LawDocCo’s case, it streamlined into a new product-solution the instrumental-means that was originally meant to

fulfill the root-origin of its initial PsO regression opportunity-prospect, turning it into a PsO creation opportunity instead. WellnessCo deviated from the regression epistemological formation process and became the ‘outlier’ that formed a pseudo-opportunity rather than the full regression opportunity. Overconfidence bias was the *contrasting* condition and reason for WellnessCo’s deviation, which caused a severe disorientation from overindulgence in developing a new product that could not find market-demand as its instrumental-means. WellnessCo unknowingly breached the most critical aspects of the regression epistemological formation processes – social construction and social cross-validation by the market.

5.3.3 Section summary

The Taijitu is an excellent visual and rationalization tool for showing the epistemology of how an opportunity is formed. It complements the opportunity-hexadecadrant in facilitating an understanding of opportunity’s ontology. Figure 5.24 visualizes the yin-yang ontological environments where different ‘types’ of opportunity are formed in practice, which accord with the ones conceptualized by the O-O-P framework.

Empirical findings verify that opportunities are dualistic nexuses of demand and supply interacting as either the root-origin or instrumental-means in existing and new market situations. The *outlier* is WellnessCo’s *pseudo*-opportunity, which is an ‘incomplete’ nexus having only a single, unitary element (supply) but lacked the other dualistic counterpart (demand) to become a real opportunity (yin-yang holistic duality tenet).

Figure 5.24 – Tajitu of opportunity-formation epistemologies

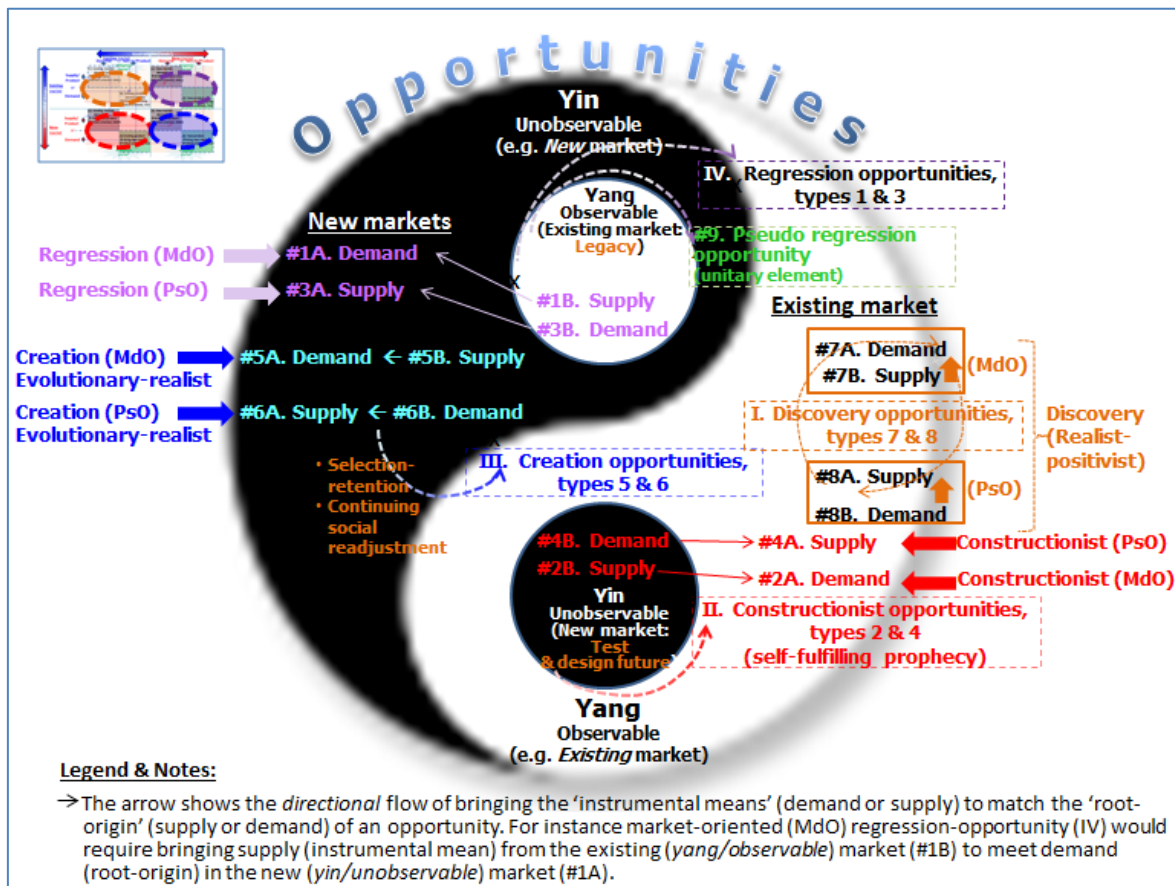


Figure 5.24 also depicts the four different epistemological formation processes and actions associated with eight types of MdO and PsO opportunities as revealed by empirical findings. For reasons given earlier, the discovery/positivist tradition is not covered in this research. The other three formation epistemologies do accord with the traditions explained by the conceptual O-O-P framework in the spirit of the yin-yang notion's holistic, dynamic, and dialectical duality tenets. As evident from the multiple holistic case studies undertaken in this research, there are strong literal and theoretical replications generalizable analytically to the notions of the O-O-P framework. They assert its internal and external validity. The following summarizes the empirical findings of this research in regard the startup-venturing phenomenon. It includes the ontological nature of opportunity, the causality patterns, and orientations among opportunity and the other core variables like venture-outcome, the epistemological approaches of forming different types of opportunities in the IO-nexus of entrepreneurial process:

- (a) The ontological nature of opportunity is as generalized by the duality tenets of the yin-yang philosophical concept. Opportunity is a holistic nexus of demand and product-supply. There is no ‘opportunity’ unless the dualistic and dialectical elements are co-present as illustrated by WellnessCo. Opportunity as an objective reality may or may not be observable, knowable, or detectable, to the entrepreneur. Its dynamic nature (temporal, evolving/transformative, malleable, multiplicative, and divisible) allows interaction with the entrepreneur. In this sense, it can be said that human action in “opportunity development” (Ardichvili, et al., 2003, pp. 106, 113) is an important ingredient to an opportunity’s conception (Dimov, 2007b), streamlining, and/or segmentation that are part of the IO-nexus of entrepreneurial process.
- (b) The initial antecedent root-origin of an opportunity defines the venture-outcome, its orientation, as well as that of the epistemological formation processes.
- (c) The opportunity-formation processes in practice *conform* to the epistemological notions explained by the conceptual O-O-P framework.
- (d) Segmenting the root-origin (GutHealthCo) and streamlining the instrumental-means (LawDocCo and ExtractCo) can be done to enhance the value of the initial opportunity-prospect. However, the epistemological processes will have to be re-oriented accordingly to form the eventual opportunity. Moreover, the root-origin must remain as the unifying focus and orientator of venture-outcome and the formation processes.
- (e) The findings show that so long as the root-origin (streamlined, segmented, or altered as ‘*quasi*’) is kept as the unifying focus and orientator of the causal connections, venture-outcome, and opportunity-formation process as conceptualized and explained in the O-O-P framework, the result can range from satisfactory (LawDocCo and ExtractCo) to good (GutHealthCo). However, deviation and disorientation can result in cost overruns, cash burn, and delays in

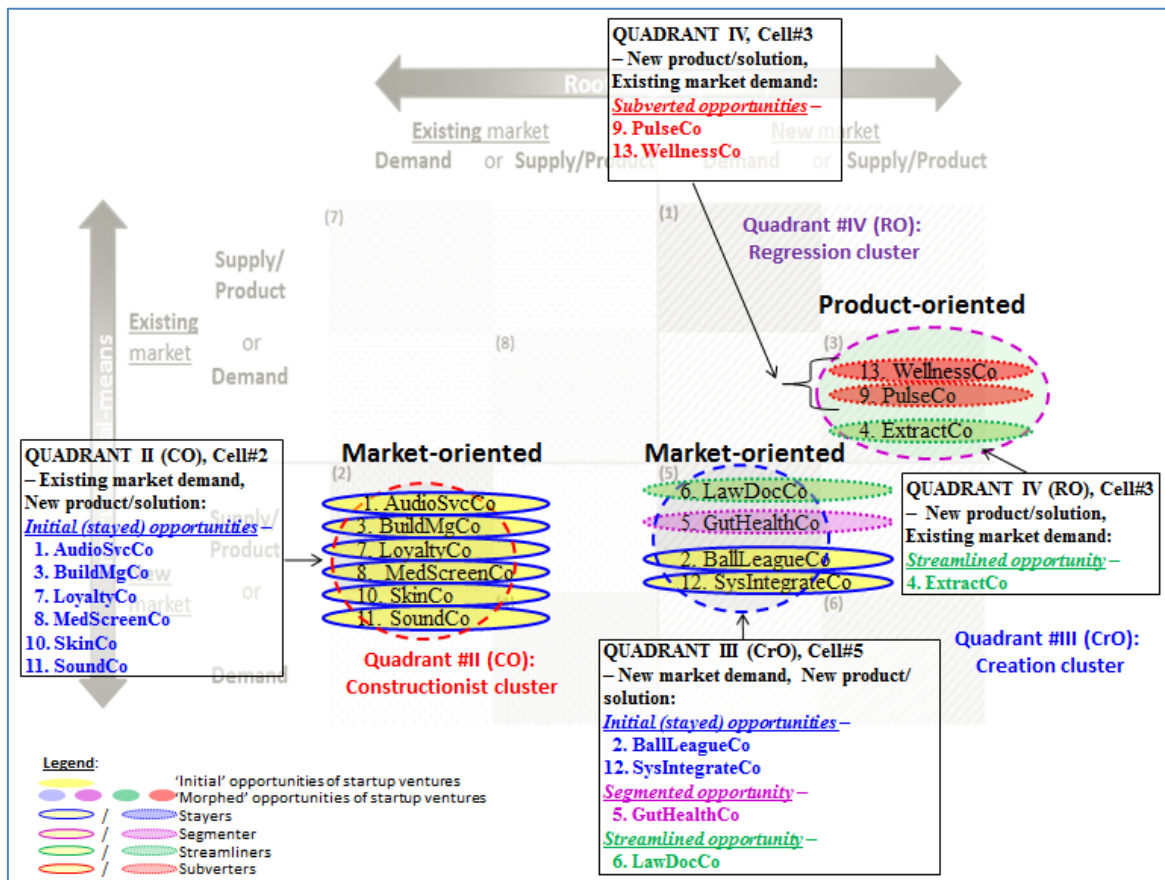
commercialization and eventual exit. The consequences can range from bad (PulseCo) to catastrophic (WellnessCo).

- (f) A startup-venture can change (subvert) the initial root-origin, as in the case of the venture-subverters. *Ex-post* the change however, the *opportunity* along with the instrumental-means would need to be *re-oriented* to the *quasi* root-origin in its *altered* state in order for the opportunity to eventuate. As the findings demonstrate, overconfidence biases can be the cause of change, which predictably would lead the epistemological formation processes to deviate from the notions of the O-O-P framework. PulseCo is an example. It finally understood, albeit with a lag, the need to re-orientate the epistemological process to form the opportunity in line with altering the role of ‘product’ (the instrumental-means) as the quasi root-origin. In contrast, WellnessCo did not understand. Having inverted the instrumental-means (product) into the role of quasi root-origin, it did not follow the process fully to transform its initial constructionist opportunity into a regression opportunity. Overconfidence caused Wellness to overindulge in product development to the neglect of market-demand (the initial root-origin turned instrumental-means). What transpired for WellnessCo was a pseudo-opportunity, having product as the single and only element. Therefore, its regression opportunity *could not be fulfilled or become* as a holistic duality nexus of product and demand.

5.4 Opportunity exploitation process and orientation

The preceding section discussed the processes and actions undertaken by the 13 startup-ventures to form their respective opportunities. This final section contains the empirical results on how the startup-ventures orientate the IO-nexus of entrepreneurial processes and actions when *exploiting* their opportunities. Empirical findings rendered in Figure 5.25 shows the exploitation processes of the venture-cases clustered in terms of MdO and PsO.

Figure 5.25 – Clustering of formed-opportunities in terms of root-origins



5.4.1 Empirical findings

The empirical findings show *no surprises* in that the opportunity-exploitation processes and actions of startup-ventures bear orientations that are either MdO or PsO, depending on their opportunity's root-origin. They comprise:

- a cluster with *MdO* root-origin, which have six constructionist and four creation opportunities, and
- a cluster with *PsO* root-origin, with three regression opportunities.

5.4.2 Analysis

Three key observations can be made on the research findings. *First*, when the respondents of the 13 startup-ventures were asked *generally* to describe what they did or how the process was like in respect of the actions taken to exploit their opportunities, they cognitively articulated their respective actions by using *semantics* that *related* to marketing and/or product (in terms of its production, innovation, and development).

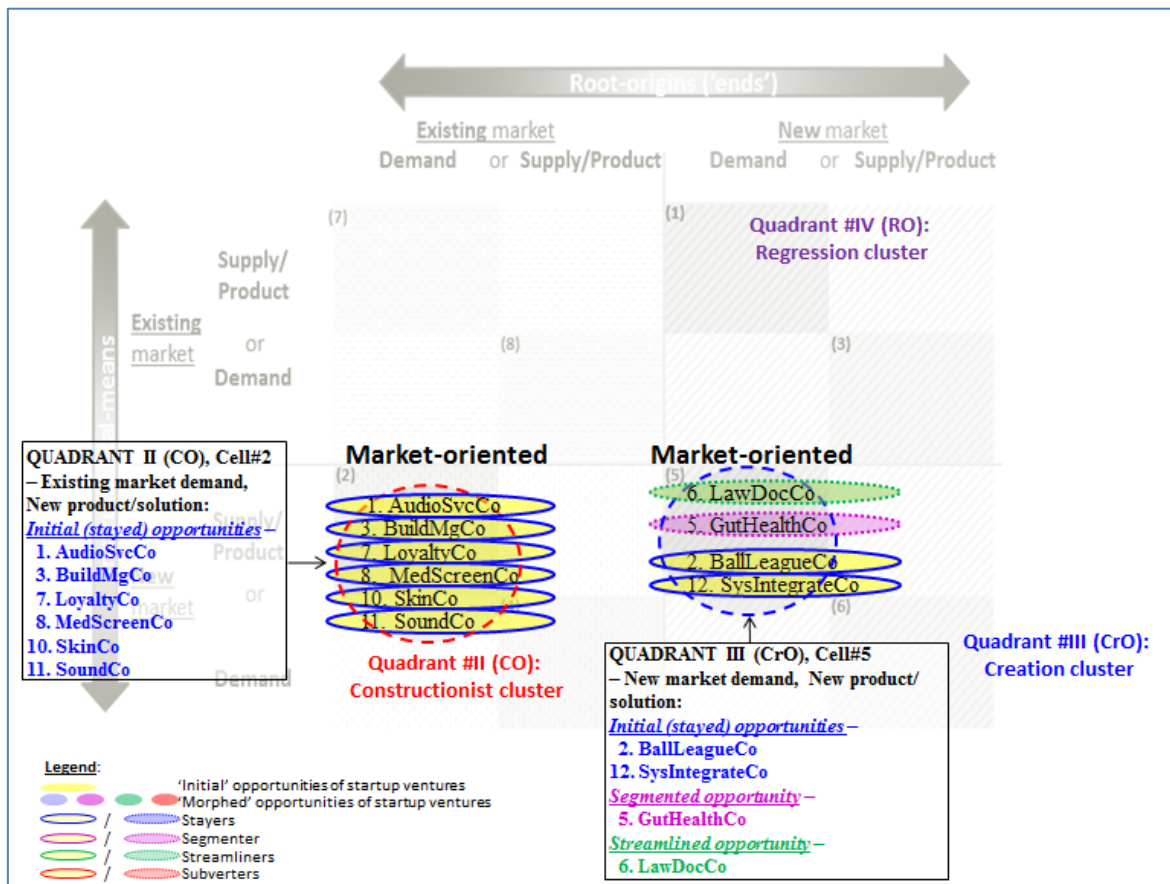
Second, when each respondent described the functional marketing-related and product-related activities/events of his/her exploitation process, the *context* was always in *reference* to fulfilling the opportunity's root-origin as the *venture-outcome*. Without exceptions, the exploitation of opportunities are invariably dependent on and oriented by the source or *root-origin* of the opportunity that the entrepreneurs had formed as discussed in the preceding [Section 5.3](#).

Third, the operational dimensions of marketing-related and product-related functional activities taken for opportunity-exploitation as articulated by the respondents can be categorized by using the general short-list format in Table 3.2. Applying the categorizations in Table 3.2 facilitates the analysis of the orientations (MdO or PsO) of the marketing-related and product-related activities taken in relation to the different types of opportunity. This in turn helps to assess the analytical generalizability of the conceptual O-O-P framework's causal connections.

5.4.2.1 Market-oriented exploitation processes

As mentioned in [Paragraph \(a\) of Section 5.4.1](#), 10 startup-ventures had formed opportunities with MdO root-origins of which six were *constructionist* opportunities and four *creation* opportunities (see Figure 5.26 below). The range of marketing-related and product-related activities taken by each of the 10 ventures to exploit its respective opportunity was focused on achieving *MdO* venture-outcomes – to bring products to market (i.e., to bring the type of product that the market needed).

Figure 5.26 – Formed opportunities with market-oriented root-origin



(A). Market-oriented constructionist opportunities

The findings show that venture-cases with MdO constructionist opportunities consistently followed exploitation processes having MdO venture-outcomes that are oriented by market-related root-origins. Although the processes are described sequentially, they actually *overlap* with each other, and often happen *contiguously* (Low & MacMillan, 1988).

(1). AudioSvcCo

Having formed its MdO constructionist opportunity, AudioSvcCo evaluated the *general business conditions* (an MdO dimension of market feasibility analysis in Table 3.2) in China's post-production audio-services market as justifying the opportunity to fill the need for better project

management solutions. As part of its overall *sales development strategy* to attain a planned sales turnover of about NZ\$4 million within five years, AudioSvcCo ‘wired’ itself into the Shanghai Film Festival, which is a *known distribution channel* for collaborative solutions. AudioSvcCo’s Chinese language skills gave it the *competitive edge* in securing the channel over its peers from New Zealand.

To bring its service-solution to the Chinese market, AudioSvcCo kept a physical presence in China until a deal could be signed. The domestic office would then be used a center for customer-interaction and to provide a shared avenue for concerted actions by different people (Kohli & Jaworski, 1990). In the area of *product development*, the company was planning to link all the audio tools together as an MdO product-differentiation strategy (see Table 3.2) for its innovative solution. At the time of interview, the company was making positive strides in pushing its post-production services to China.

“[W]e’ve got a plan for 90 days with me going back up to Shanghai Film Festival, which is another film market. And at the film market, we’re gonna to sign . . . we’re aiming for 2 deals.” (AudioSvcCo)

(2). BuildMgCo

BuildMgCo assessed the *business conditions* (an MdO dimension of market feasibility analysis in Table 3.2) and found them conducive for its MdO opportunity to develop a technology that would enable builders to automate their downstream construction processes. To ensure *market acceptance* (another MdO dimension of market feasibility analysis in Table 3.2), the company sought funding to develop its prototype solution which involved the participation of potential customers. The *business plan* (a dimension of interfunctional coordination and business planning) was MdO with inter-functional objectives of proving the concept, and determining that “there was a market” and a “business case.” To bring the product to market, the company leveraged on strategies like word of mouth and personal relationships to *develop sales* (an MdO dimension of sales development strategy in Table 3.2). As a market-entry tactic, it promoted its product-solution as being oriented to the needs of the market segment for small builders who

have lesser computer literacy skills. BuildMgCo had since moved on from start-up to an early growth stage of its opportunity-adventuring cycle.

“[W]e’re at a stage where we will start putting in other small builders [as customers] and we think that at some point enough where builders with less [computer literacy] skills will be able to take it on. So . . . sort of challenge over the next probably 6 months is to keep working on that and basically look for finance, figure out our models for how we can grow the business.” (BuildMgCo)

(3). LoyaltyCo

To assess market feasibility for the MdO opportunity of bringing an innovative program that allows consumers to utilize loyalty points across retailers, LoyaltyCo conducted market survey and research. It evaluated *market competition* (an MdO dimension of competitive analysis and market differentiation strategy in Table 3.2), analyzed the strengths and weaknesses of the monopolistic incumbent in the New Zealand, and developed a new *business model* (an MdO interfunctional coordination and business planning in Table 3.2) to bring a better solution to the local marketplace. While its MdO product development strategy entailed replicating 30% of what the competitor was doing, and cloning workflows that already existed in the market, LoyaltyCo’s new solution aimed to “fit the *market* better.” As part of an extended market research and effort to elicit market intelligence, the entrepreneur even phoned the providers of loyalty points in the United States, pretending to be a prospective merchant. The purpose was to migrate ‘best practices’ from overseas and bundle them into an innovative solution to better meet the needs of the local market. The basic plan was to develop an MdO, competitively differentiated product (a dimension of market differentiation in Table 3.2) that offered consumers the unique value proposition (**UVP**) of using their loyalty points with different retailers. Cost-advantage was another UVP of LoyaltyCo’s product offering. Like BuildMgCo, the founder also leveraged on his network of personal contacts as a go-to-market strategy. He approached merchants whom he knew as friends. LoyaltyCo was thus able to sign-on quite a number of merchants.

(4). MedScreenCo

MedScreenCo's founder was a doctor with the immigration department. The MdO opportunity to bring medical screening services that are convenient to insurance applicants was formed by his cognitive awareness that such a market need existed as an objective reality. He evaluated the opportunity as having *market growth potential* (an MdO dimension of market feasibility analysis in Table 3.2), one that was scalable beyond New Zealand to Australia and Southeast Asia.

The efforts taken for product development were market-oriented, and very "client-focused, client-centric." MedScreenCo adopted a multifaceted sales development strategy that propositioned numerous benefits to customers. For instance, when selling its screening services to known distribution channels such as insurance companies (an MdO dimension of sales development in Table 3.2), MedScreenCo would highlight how its services might improve the health of sedentary people and thereby reduce medical claims over time. MedScreenCo justified this as an UVP for insurance companies to subsidize the costs of medical screening, which would in turn lead to greater utilization of MedScreenCo's screening services. When signing up insurance applicants on the other hand, MedScreenCo would promote its product as a convenient way to schedule a mutually convenient time with nurses for 'onsite' blood tests and medical screening. The service attribute of 'convenience' was an attractive UVP to insurance applicants. It gave MedScreenCo the MdO *differentiated competitive advantage* that it needed. For after sales service, MedScreenCo used Survey Monkey™ to monitor customer satisfaction levels. To focus all of its product-related and marketing-related activities on customer-orientation, it borrowed the customer-service methodology practiced by a local café, which had proven to be highly effective. Using these various MdO strategies, MedScreenCo was successful in bringing the screening services to customers.

"At the moment we probably have about 15% market share." (MedscreenCo)

(5). SkinCo

SkinCo assessed the feasibility of its MdO opportunity by talking to potential customers like pharmacies, doctors, and parents with small children. The conversations revealed the opportunity

to bring a new skin cream to the existing dermatological market, which needed to resolve skin dryness, stop the itching, stop the actual rashes, and so on. These gaps in demand were not filled by the existing product-offerings of pharmaceutical majors like Procter & Gamble, L'Oréal, and Pfizer. Patent searches also revealed that no competing products would emerge in the near term, which assured a lead-time in market acceptance for SkinCo's new skin cream and justified a business case. The subsequent process of product development and design was likewise *market-oriented* (a dimension of market differentiation strategy in Table 3.2), as SkinCo relied heavily on consumer feedbacks and consumer test groups. SkinCo filed patents to protect intellectual property rights, solidify the *market position* of its new product, and preclude market imitations (Shane, 2001). Clinical trials with the United States Food and Drug Administration (USFDA) were also conducted with patients to prove efficacy.

“Basically I then went about working out how actually to launch the cream, and basically working how I needed to market the cream to that particular market.” (SkinCo)

The entrepreneur also decided to implement all the MdO '4Ps' of marketing-related activities in bringing the product to market (an MdO dimension of sales development strategy in Table 3.2) and develop sales. These activities focused on:

- (a) offering the convenience of *place* to customers, by distributing products through the store locations of known distributors like Life Pharmacy™ and Blackmore™;
- (b) *packaging* formulations with the right fragrance in containers designed with attractive labels;
- (c) conducting regular advertising and *promotion* campaigns;
- (d) customizing a *pricing* structure for products that catered to different age groups, such as a junior range that was safe for kids, and a high-end cream containing the more expensive kiwi fruit seed oil for the older age groups.

The key UVP in bringing its product to market was ‘naturalness,’ which emphasized the fact that it was made from edible food ingredients without solvents or preservatives, and therefore safe to use on children, completely natural.

SkinCo’s MdO efforts to target skincare as a market niche were sensible. The strategy is generally consistent with the findings of Klevorick, et al. (1995), that firms in certain types of businesses (like cosmetics) tend to assign more importance to designing market segments along different attributes (e.g., cost, functions, reliability, and size).

As at the date of research interview, the company’s skin cream had completed Clinical Phase I trials in the United States and managed to sign up a major pharmaceutical and nutraceutical distributor to push its product to the dermatological market. SkinCo’s MdO success supports Shane’s (2001) finding.

“[The] four dimensions of technology regime—the age of the technical field, the importance of market segmentation, the effectiveness of patents, and the importance of complementary assets—influence the propensity of new firms to be formed to exploit technology” (p. 1174).

(6). SoundCo

The knowledge of SoundCo’s entrepreneur regarding the existence of an MdO opportunity came from his work on the film, *Lord of the Rings*. He saw the opportunity to innovate a productivity tool to plug an unfilled market need (an MdO dimension of market feasibility analysis in Table 3.2) of post-production professionals to process blockbuster films within a compressed timeframe prior to screen release. He was confident that his innovative product-solution would find “market validity” and acceptance, but he found it very difficult to prove “business validity” in terms of *growth potential* for the company’s innovation in market. The reason for the difficulty was that SoundCo’s product-solution had to be designed as a plug-in tool that operated on a collaboration platform monopolized by an American distributor (an MdO sales development strategy in Table 3.2). The distributor was the only source of market data and intelligence regarding market size and growth potential that SoundCo had to rely on but later found to be

grossly exaggerated. The *representativeness bias* (Busenitz & Barney, 1997) caused fallacies in SoundCo's business planning. Thus even though the marketing-related and production-related activities were appropriately *oriented by market needs*, the market size was much smaller than originally thought to justify the money spent on starting up SoundCo's business. It lacked sustainability and eventually failed.

"[Y]ou know I always thought that . . . there's a point where you know it's just gonna disappear, you know. Someone's gonna say, you know, 'Oh no, sorry you can go . . . you have to go home now.'" (SoundCo)

(B). Market-oriented creation opportunities

The findings show that venture-cases with MdO creation opportunities also followed overlapping and contiguous exploitation processes that are oriented by market-related root-origins to achieve *MdO* venture-outcomes.

(1). BallLeagueCo

BallLeagueCo's MdO creation opportunity was formed to bring a game experience to amateur basketballers. Its opportunity-exploitation processes and activities were premised on finding a customer first *before* developing the product. This de-risking strategy was purposely done to prove that a feasible business existed for the opportunity *before* time and effort were spent on marketing-related and production-related activities to serve the market need.

Interview data showed that BallLeagueCo's product development strategy placed substantial emphasis on *user-requirements* (an MdO dimension of market feasibility analysis in Table 3.2). The company would gather user-feedbacks to prototype and evolve a "minimum viable product" that the market would *accept* and subscribe. The attribute of quality in product-related activities was defined as an MdO sales development strategy (see Table 3.2) to support premium prices and strong user-uptake. Steps were also taken to patent the product, to protect its differentiated UVP of providing users with "an NBA experience" and preempt imitation by competitors.

To internationalize its market development and sales plan (a dimension of sales development strategy in Table 3.2), BallLeagueCo's conducted market validations by phoning prospective distribution partners in different geographic regions, such as the US. At the time of research interview, BallLeagueCo was planning to take its game-video platform to the US market.

"[W]hile we are looking at the US because we're planning to raising funds there, we'll also be evaluating other international markets also that potentially are suitable."

(BallLeagueCo)

(2). SysIntegrateCo

Although "passion" was the initiating thought, SysIntegrateCo ethnographically validated the *market feasibility* (see Table 3.2) of developing a platform that integrated multiple medical devices and provide physiological information on patients under critical medical care. To ensure that the platform met market needs, the company adopted a market-orientation approach when determining the type of algorithms, prediction models, and artificial intelligence to be incorporated.

SysIntegrateCo purchased the intellectual property of a distributor undergoing receivership to shorten the product development cycle, and accelerate time-to-market. The MdO marketing-related strategies taken to bring its product to the market and *develop sales* also included attending trade missions, getting involved in conferences that generated customer-leads (an MdO dimension of sales development strategy in Table 3.2), and implementing reference-sites in hospitals. The company's opportunity-exploitation processes were *MdO* and prioritized so that the marketing-related activities would generate sales, which then drive product-development and production-related activities that were oriented to market needs.

"[T]here's always been this for me is working in the business and working on the business and working on the product all the time, it's a bit hard . . . and there's no real clear line between them, you know. They all overlap." (SysIntegrateCo)

The *after-sales* activities were equally MdO and designed to serve *customers* (an MdO dimension of market differentiation strategy in Table 3.2). SysIntegrateCo would teach them

how to operate the platform. It also rolled out upgrades *without any charges*. SysIntegrateCo was quite advanced in sales development at the time of research interview.

“[W]e’re now moving from being a start-up, slow, performing start-up company into . . . that sort of potential to be a hockey-stick growth company.” (SysIntegrateCo)

(3). GutHealthCo

To understand market conditions, GutHealthCo went to the pharmacies, doctors, and consumers, and worked out all about the current existing products in the market, like MetamucilTM, FybogelTM, and so on (an MdO dimension of market feasibility analysis in Table 3.2). The founder then added her scientific knowhow to develop and bring a digestive product that the market would want for IBS (an MdO dimension of competitive analysis and market differentiation strategy in Table 3.2). GutHealthCo indeed had a *feasible* opportunity with *potential to create a new market*. Consumer surveys done as part of its MdO production-related activities allowed the company to tweak its product to “what the consumers wanted.” These activities were done in tandem with USFDA clinical trials and patent filings to protect the market-oriented UVPs that the product offered. Clinical trials were also conducted to distinguish and *differentiate* the *standing* of its product in the *market* as having therapeutic efficacy. One massive marketing launch was orchestrated to develop the market and harness sales. The initiative involved product displays at pharmacy stores (the ‘*place*’ component of the 4P-marketing strategies), and *promotional* campaigns such as TV commercials, breakfast shows, and so on (an MdO dimension of sales development strategy in Table 3.2). As a result, GutHealthCo succeeded in its market-oriented game plan to “grab the consumers’ eye,” and clinch the “number 1” spot in the brand new gastro-intestinal market category. This aligns with the phenomenon that Shane (2001) observes, which strategic management scholars might find interesting:

“[I]n segmented markets, new firms can obtain a foothold for a new technology before facing competition from established firms . . . [and also] emerge as competitors of established companies.” (pp. 1176, 1187)

(4). LawDocCo

For LawDocCo, the *feasibility* of its opportunity was justified by regulations, which emerged to create the need in the legal profession market to track staff development. Market surveys enabled the company to define the scope of market need and refine the product specifications required. The product was then co-developed with prospective corporate users to ensure eventual *market acceptance* (an MdO dimension of sales development strategy in Table 3.2). Integral to the MdO *production-related activities* were iterations of mockups based on user-feedbacks. These strategies mitigated business risks and were in line with the company's primary market differentiation strategy (see Table 3.2).

“So the whole exercise or activities around the product development had to be related back to what the customers want . . .” (LawDocCo)

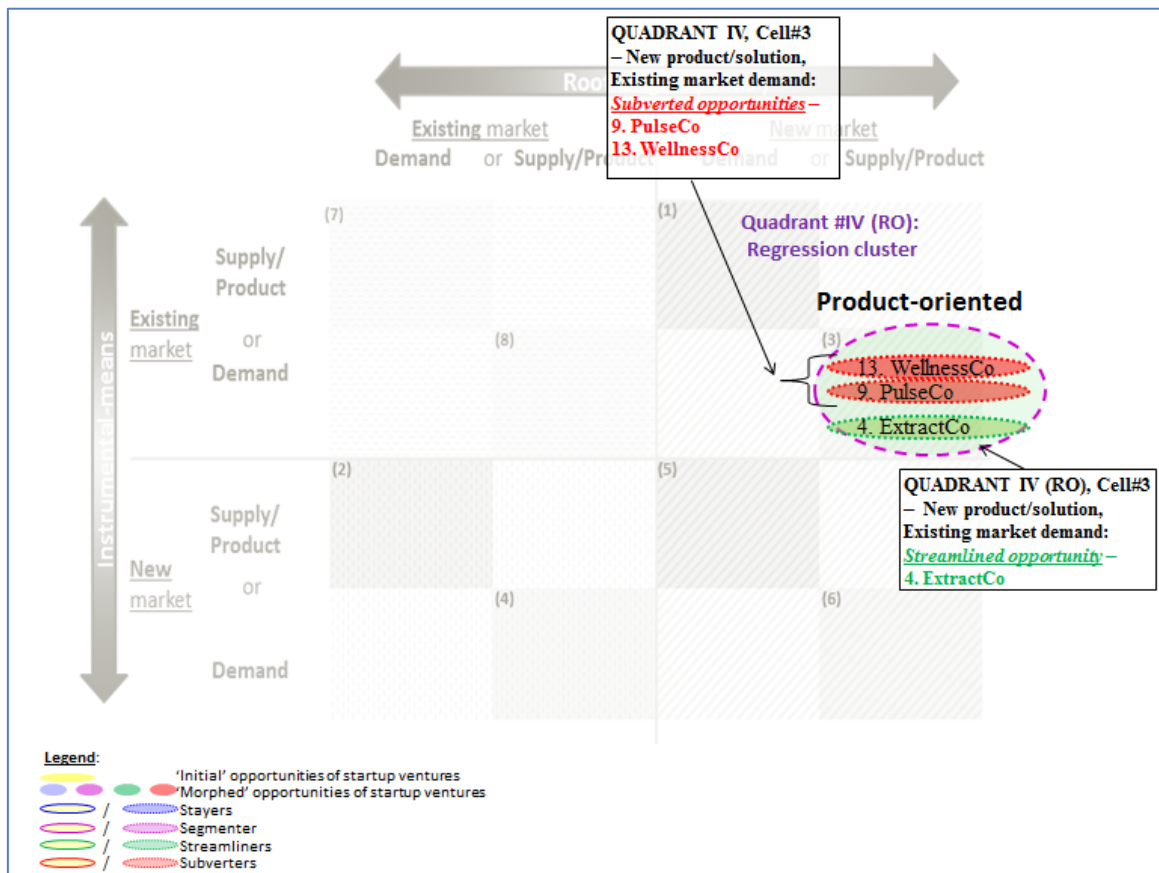
For LawDocCo, business de-risking was also evident in its market development and sales efforts. The company preferred to obtain pre-sales contract to the best extent possible, and build partnerships with *distributors* rather than selling directly. As a further reflection of the market-orientation of its opportunity-exploitation activities, LawDocCo chose software-as-a-service (SAAS) pricing model to make its product affordable and encourage market-uptake.

“[A]t the moment we've got about 1 in 7 New Zealand lawyers using the product. So we are very happy with the progress.” (LawDocCo)

5.4.2.2 Production-oriented exploitation processes

As also mentioned earlier, there are three startup-ventures with opportunities having PsO root-origins formed by regression epistemological tradition (see Figure 5.27 below).

Figure 5.27 – Formed opportunities with product-oriented root-origin



The range of marketing-related and product-related activities taken by the three startup-ventures to exploit their opportunities had the common purpose of achieving *PsO* venture-outcomes. For each of them, it entailed efforts to bring market to its product, or bring the appropriate type of market that its product needed.

(1). ExtractCo

When three co-founders formed the *PsO* opportunity for ExtractCo, they had no idea whatsoever where the market customers would come from. They were totally product-focused.

“We thought that if we created [the product], the market will come.” (ExtractCo)

Simplistic and product-oriented though they might be, the three co-founders felt that the opportunity to create a screening platform for plant extracts was *technically* and scientifically *feasible* (a PsO dimension of product development strategy in Table 3.2). As a *competitive edge*, they had the *core technology* in terms of scientific knowledge and “unique skills” to make the screening platform work (a dimension of competitive analysis and product differentiation strategy in Table 3.2). As an added *competitive advantage*, they planned to deliver the screening services at a very low *cost*. In addition, they had control over a *stable supply of raw materials* by way of an agreement that was already signed with a “local IWI”⁵⁶ in New Zealand that owned the plants. They therefore “had access to all of the New Zealand extracts and nobody else did,” enabling them to create a small prototype.

To achieve the *product-oriented* opportunity’s venture-outcome of ‘*pulling*’ the market closer to ExtractCo’s service platform (a PsO business planning and interfunctional coordination in Table 3.2), the co-founders went overseas to attend an industry conference. They interacted with the participants and listened attentively to presentations on the work that was being done by other research organizations. What then happened was the use of ‘bluff’ to complement their PsO *market-pull development strategy* (see Table 3.2)

“*[W]e had no money, and we basically faked that we had it all in place. We had part of it in place but we basically bluffed our way to [a global agribusiness company]*⁵⁷, and they offered us a contract.” (ExtractCo)

Although the fib is not a business ethic that can be condoned, it was part of the *business plan* to achieve the *PsO* opportunity’s venture-outcome by pulling in the market. To complement market-pull, ExtractCo bought second-hand equipment and hand-made things to build the service-platform façade.

“*And by the time [the agribusiness customer] came to see us, we looked like we actually knew what we were doing.*” (ExtractCo)

⁵⁶ ‘IWI’ refers to a Maori community or people in New Zealand.

⁵⁷ Name withheld to preserve anonymity.

“Winging” the first contract had the snowballing effect of furthering ExtractCo’s product-development credibility, which helped to pull in other market users (a PsO dimension of business planning and interfunctional coordination in Table 3.2).

In their *naivety* however, the co-founders did *not* include in the PsO *production-related activities* patent filing (a PsO dimension of product development strategy in Table 3.2). One of its major customer reverse-engineered the extract it bought from ExtractCo and asserted a proprietary claim over it with patent filing. Hence, even though ExtractCo did manage to achieve its PsO venture-outcome at the start-up stage, its business was ‘pilfered’ by its customer. ExtractCo’s experience illustrates the importance and effectiveness of patents in the biotechnology industry, as compared to say the electrical devices.

“[B]iotechnology patents are fundamentally stronger than electrical device patents because the slightest change in molecular structure can radically change the performance of a biological agent, whereas relatively major changes in the design of an electrical device can be accomplished without changing the functioning of the device.”
(Shane, 2001, p. 1180).

(2). PulseCo

Product-orientation was also witnessed in PulseCo’s production-related and marketing-related activities that were undertaken to exploit the opportunity that it formed in regard producing a cardiovascular information device. Product-orientation guided product-development which was enabled by the co-founders’ medical and technology knowhow.

“It wasn’t even a matter of bringing out a ‘good’ product; it was a matter of bringing out a product that did what we wanted it to do.” (PulseCo)

Marketing-related activities were placed on the backburner, as the company “[was] not doing any user needs validation of anything like that.” The company emphasized PsO activities, which sole purpose was to prove *product/technical-feasibility* and the *superior performance* of its device, which had the *competitive differentiation* of being completely non-invasive. Hence, only

clinical validations of a *technical* and *PsO* nature were done, which involved “correlating [cardiac] valve measures with existing gold standards.”

PulseCo’s go-to-market *business plan* was likewise *PsO* to pull and attract market attention to buy this product, particularly the attention of medical device companies, by presenting clinical validations and technical findings. The intention was *PsO* “to get doctors interested so that we could *do research, more than selling them a product.*” To further its product development activities, PulseCo obtained CE mark and ISO 13485 certifications for its device. All the business planning and interfunctional coordination strategy activities that were done therefore reflected a product-orientation (see Table 3.2).

“[I]t was I guess implicitly decided that we would try and take it a bit further before we sell off the IP.” (PulseCo)

As mentioned in Paragraph (A) of Section 5.2.3.3, PulseCo’s overzealousness led to overconfidence bias which translated into *planning fallacy* (Buehler, et al., 1994; Kahneman & Tversky, 1979) and *illusion of control* (Langer, 1975). Product development took much longer and at much higher cost than projected. The company then decided to explore other functional options to pull the market to its device, such as license out the IP, sell the IP, or sell the business altogether to a medical device company. The first option was ruled out because the expected stream of licensing revenue was unable to sustain further product development. As for the second and third options, PulseCo was indifferent because it was a single-product company. Finally, the last option was chosen as a quick means of bringing the market through the acquirer to the product.

(3). WellnessCo

WellnessCo was the most radical example of a *PsO* startup-venture afflicted by overconfidence bias.

“So the first thing I did was to go and build the product.” (WellnessCo)

Even after forming its opportunity to provide an online health and wellness management portal, the PsO production-related activity of product development continued to be the company's *singular preoccupation and exploitation activity*.

"I got . . . some developers . . . overseas to develop the product, to actually build all the product out . . . once we've built the product, we then try to sell it to the market."
(WellnessCo)

WellnessCo did not validate with the market when building its online portal. After the product was launched, it managed to pull in only "a few early clients" as a venture-outcome for its PsO opportunity.

"[A]t the height of the product, I think we had about 3 or 4 thousand people using it . . . but . . . the revenue from that was . . . nowhere near covering us to sustain more business or even product development at that stage." (WellnessCo)

Then recession struck, and cost-cutting measures by its clients shrunk the utilization levels of its product. To counter the decline in revenues, the company tried to apply the freemium model to pull market users to its online portal (a PsO dimension of business planning and interfunctional coordination strategy in Table 3.2). The pricing strategy increased utilization, but WellnessCo was still unable to convert them into paying customers.

"So the economics just didn't make sense for us. So we ended up shutting it down."
(WellnessCo)

5.4.2.3 Section summary

The two clusters of MdO and PsO opportunities provide direct results as *literal replications*, while across and between the clusters, they provide contrasting conditions but for predictable reasons as *theoretical replications* (Yin, 1994). From the above analysis, the following observations can be drawn from the findings on the opportunity-exploitation processes.

- (a) Causal connections and orientations. The root-origin of an opportunity *defines* the orientation (either MdO or PsO) of its *outcome* and *formation*, and in turn, the subsequent *exploitation* processes, and activities that take place.
- (b) Opportunity-exploitation process and activities
 - (i) The opportunity-exploitation process employed by the startup venture-cases cover the gamut of functional marketing-related and product/production-related activities, operationalized with the dimensions as presented in Table 3.2 to facilitate easy identification of their orientations.
 - (ii) Rather than being discrete, the marketing-related and product-related activities typically *overlap* with each other, and often happen *contiguously* as observed by Low and MacMillan (1988).
 - (iii) Table 5.5 provides a non-exhaustive list of specific functional marketing-related and product/production-related activities that can be applied in practice. They are drawn from the respondents' comments. Some of the activities overlap *both* marketing-related *and* product-related purposes. In other words, some of them can serve functionally as marketing-related and product-related activities. Others are *standalone* marketing-related or product-related activities. For instance, focus/customer test group analysis can be used for technical feasibility analysis and/or market feasibility analysis.

Table 5.5 – List of specific functional marketing-related and production-related activities of participating startup-ventures⁵⁸

General product-related opportunity exploitation dimensions	Examples of product-related opportunity-exploitation activities	Examples of marketing-related opportunity-exploitation activities	General marketing-related opportunity-exploitation dimensions
Product/technical feasibility analysis	<ul style="list-style-type: none"> -Focus/customer test group (SkinCo), user feedbacks (BallLeagueCo, GutHealthCo, LawDocCo, LoyaltyCo, PulseCo), user requirements (BallLeagueCo) -Patent search (SkinCo) -Competitive analysis – strengths & weaknesses (LoyaltyCo) -Gap-analysis (MedScreenCo, SkinCo, SoundCo) -Scenario analysis (SoundCo) -Technical validation -Survey & research (PulseCo) 	<ul style="list-style-type: none"> -Value-chain analysis (MedScreenCo) -Market-validation – surveys & research (BallLeagueCo, LoyaltyCo, SkinCo) -Business-validation – Business case (BuildMgCo, BallLeagueCo), Scalability (MedScreenCo) -Talk with potential customers (BuildMgCo, GutHealthCo, PulseCo) -Fact-finding (AudioSvcCo, SysIntegrateCo) [SoundCo] -Michael Porter five forces analysis [SoundCo] 	Market feasibility analysis
Business planning & inter-functional coordination	<ul style="list-style-type: none"> -Proof of concept/idea, prototyping (BuildMgCo, PulseCo) -Minimize risk: Pre-sales contract (LawDocCo), find customer first (BallLeagueCo), co-development (LawDocCo) -Exit strategies: Sell/license out IP (PulseCo), sell business (PulseCo) 		Business planning & interfunctional coordination
Product development strategy	<ul style="list-style-type: none"> -Product – convenience (BuildMgCo, MedScreenCo), productivity (AudioSvcCo), process automation (BuildMgCo), quality (BallLeagueCo), cost (ExtractCo) -Minimum viable product (BallLeagueCo) -Bluff/lie (ExtractCo, LoyaltyCo) -Ethnography (SysIntegrateCo) -Technical skills & scientific/medical knowhow (SkinCo, GutHealthCo, PulseCo) -Pure research (PulseCo) -Co-development (LawDocCo) 	<ul style="list-style-type: none"> -Known distribution systems (AudioSvcCo, SkinCo, MedScreenCo) -Networking: Word of mouth (BuildMgCo, LoyaltyCo), introductions & trade mission (SysIntegrateCo) -Partnerships: Distributors (LawDocCo, GutHealthCo, SkinCo) -Customer interaction (AudioSvcCo, 	Sales development strategy

⁵⁸ The names of company parenthesized in red fonts indicate the venture-cases that omitted to undertake the activity stated against its name. For instance, SoundCo did not do a proper due diligence or the Porter five forces analysis (Porter, 2008) which it should have. ExtractCo omitted to file patent on its intellectual property, which allowed its customer to plagiarize, modify, and claim as its own.

General product-related opportunity exploitation dimensions	Examples of product-related opportunity-exploitation activities	Examples of marketing-related opportunity-exploitation activities	General marketing-related opportunity-exploitation dimensions
		LawDocCo) -Customer-oriented service (MedScreenCo) -4Ps: <ul style="list-style-type: none"> • Place – Shop display (AudioSvcCo, SkinCo) • Packaging (SkinCo) • Promotion (GutHealthCo, SkinCo) • Pricing (BallLeagueCo, WellnessCo) <ul style="list-style-type: none"> ◦ Multi-tier (SkinCo) -Reference sites (SysIntegrateCo) -After-sales: Satisfaction (MedScreenCo), free upgrades (SysIntegrateCo)	
Competitive analysis & product differentiation strategy	-Competitive analysis – strengths & weaknesses (AudioSvcCo, GutHealthCo, LoyaltyCo, SkinCo) -Unique value propositions (UVPs): <ul style="list-style-type: none"> • Ease of use, user friendliness, user experience (BuildMgCo, SoundCo, BallLeagueCo) • Non-invasive (PulseCo) -Patent (SkinCo, BallLeagueCo) [ExtractCo] -Clinical trials & regulatory filings (SkinCo), certifications (PulseCo) -Cross-platform/devices (LoyaltyCo, SysIntegrateCo,) -Demographic segmentation (SkinCo) -Language proficiency (AudioSvcCo)		Competitive analysis & market differentiation strategy
Product/technical feasibility analysis	- Focus/customer test group (SkinCo), user feedbacks (BallLeagueCo, LawDocCo), user requirements (BallLeagueCo) - Patent search (SkinCo) -Competitive analysis – strengths & weaknesses (LoyaltyCo) -Gap-analysis (SkinCo, GutHealthCo) -Technical validation	-Value-chain analysis (MedScreenCo) -Market-validation – surveys & research (BallLeagueCo, LoyaltyCo, SkinCo) -Business-validation – Business case (BuildMgCo, BallLeagueCo), Scalability (MedScreenCo) -Talk with potential customers (GutHealthCo) -Fact-finding (AudioSvcCo) [SoundCo] -Michael Porter five forces analysis [SoundCo]	Market feasibility analysis
Business planning & inter-functional coordination	-Proof of concept/idea (BuildMgCo) -Minimize risk: Pre-sales contract (LawDocCo), find customer first (BallLeagueCo), co-development (LawDocCo) -Exit strategies: Sell/license out IP (PulseCo), sell business (PulseCo)		Inter-functional coordination & business planning
Product development	-Product – convenience (BuildMgCo, MedScreenCo), productivity (AudioSvcCo), process automation (BuildMgCo), quality (BallLeagueCo),		Sales development

General product-related opportunity exploitation dimensions	Examples of product-related opportunity-exploitation activities	Examples of marketing- related opportunity- exploitation activities	General marketing- related opportunity- exploitation dimensions
strategy	cost (ExtractCo) - Minimum viable product (BallLeagueCo) -Bluff/lie (ExtractCo, LoyaltyCo) -Technical skills & scientific/medical knowhow (SkinCo, GutHealthCo, PulseCo) -Pure research (PulseCo) -Ethnography (SysIntegrateCo) -Co-development (LawDocCo)	-Known distribution systems (AudioSvcCo, SkinCo, MedScreenCo) -Networking: Word of mouth (BuildMgCo, LoyaltyCo), introductions & trade mission (SysIntegrateCo) -Partnerships: Distributors (LawDocCo, GutHealthCo, SkinCo) -Customer interaction (AudioSvcCo, LawDocCo) -Customer-oriented service (MedScreenCo) -4Ps: • Place – Shop display (AudioSvcCo, SkinCo) • Packaging (SkinCo) • Promotion (GutHealthCo, SkinCo) • Pricing (BallLeagueCo, WellnessCo) o Multi-tier (SkinCo) -Reference sites (SysIntegrateCo) -After-sales: Satisfaction (MedScreenCo), free upgrades (SysIntegrateCo)	strategy
Competitive analysis & product differentiation strategy	-Unique value propositions (UVPs): • Ease of use, user friendliness, user experience (BuildMgCo, SoundCo, BallLeagueCo) • Non-invasive (PulseCo) -Patent (SkinCo, BallLeagueCo) [ExtractCo] -Clinical trials & regulatory filings (SkinCo), certifications (PulseCo) -Cross-platform/devices (LoyaltyCo, SysIntegrateCo,)	-Demographic segmentation (SkinCo) -Language proficiency (AudioSvcCo)	Competitive analysis & market differentiation strategy

- (iv) Depending on the nature of the industry, certain activities are **critical** to the performance and even survival of a startup-venture. Failure to execute the activity can be disastrous for business. For instance, *patent* (both searching and filing) shown in Table 5.5 is crucial to high-tech initiatives in the fields of life sciences, biotechnology, and medical technology (Shane, 2001).

ExtractCo's negligence in filing patents due to naivety allowed its customer to steal the knowhow and usurp ownership.

SoundCo was also negligent, and failed to conduct a thorough, 'next level' due diligence in terms of fact-finding (see Table 5.5) regarding the microenvironment of the market where it operated. It was beset with a *representativeness bias* (Busenitz & Barney, 1997) by sourcing exaggerated secondary market information from its distribution partner who had direct contact with and a stranglehold over the primary customers. Porter's five forces analysis (Porter, 2008) would have taught SoundCo the danger of having distribution partners with monopolistic bargaining power. The misinformation or representativeness bias created a fallacious view of the market size and its potential, causing SoundCo to misjudge the *business validity* of its opportunity when drawing its business plan. Had the entrepreneur exercised due diligence by spending time to gather primary data and understand the industry dynamics, SoundCo could have chosen as its MdO sales development strategy to license out its solution to end-users rather than relying on a single distributor to generate sales.

- (v) Overemphasis on certain activities to the neglect of others can also lead to unwanted performance outcomes for startup-ventures. Planning fallacies and illusion of control caused by the *overconfidence bias* of PulseCo's founders led to preoccupation with product development at the expense of finding customers (see Table 3.2). The consequential misallocation of time and resources forced the company to sell out when it became cash-strapped.

Absent overconfidence bias, WellnessCo could also have followed a more *balanced* approach when exploiting its PsO opportunity. It could have done a more thorough PsO business plan that coordinated with other functional areas, like seeking user feedbacks at the prototyping phase to incorporate functional features that the customers would want. With a balanced approach, WellnessCo could have been able to de-risk its PsO opportunity.

5.5 Chapter summary

The empirical findings from the multiple holistic case studies provide evidence that verifies the operationalized concepts and dimensions as explained by the conceptual O-O-P framework. The findings provide rigor to this research and enhance its construct validity by creating a chain of evidence. By developing a case study protocol and a database of case studies, this research meets the criteria of reliability that ensures its overall quality and trustworthiness. Analysis performed on the research findings in this chapter revealed literal replications and theoretical replications that support and strengthen the internal validity and external validity claim of the conceptual O-O-P framework.

In summary, the analyses of the findings illuminate the notions and explanations of the conceptual O-O-P framework in regard the nature of:

- (a) the ontological nature of opportunity,
- (b) the *a priori* venture-outcome,
- (c) the causal pattern of relationships among the principal O-O-P variables, and
- (d) the dynamics of entrepreneurial process as a nexus of interaction between opportunity and the entrepreneur.

They also yield a number of additional insightful distinctions between environmental forces that are already *present* in ‘opportunity’ as opposed to those that *moderate* the relationships and connections as conceptualized and explained by the O-O-P framework, but without contradicting its fundamental explanations. The moderators causing variances and performance (actual) outcomes to deviate from venture-outcomes can include overconfidence biases (that subvert the nature of an opportunity), and misinformation or representativeness biases (which cause planning fallacies).

The findings with respect to creation opportunities support the pedagogy of ‘muddling through’ postulated by Johnston, et al. (2012). In this sense, they support the notion of “opportunity development” (Ardichvili, Cardozo, & Ray, 2003) that “opportunities are made” (p. 106) or “actualized” (Ramoglou & Tsang, 2016, p. 411). With regard regression and constructionist opportunities, the findings support the pedagogical postulations of Sarasvathy, et al. (2010) that decisions, whether conscious or unintended, can conform respectively to either:

- (a) a model of *effectuation* that the scholars advocate, where the means is predetermined (given) “without any given goals” (Sarasvathy, et al., 2010, p. 92), even though the ends may exist but not necessarily observable, knowable, or detectable (and hence appear ambiguous and uncontrollable), such as when forming and exploiting *regression* opportunities; or
- (b) a *causation* process of trying to find the undetermined means for the predetermined *a priori* end, such as for *constructionist* opportunities.

For the venture stayers/segmenters, they not only end up forming and exploiting their respective opportunities, but achieving their personal entrepreneurs’ goals as vestiges of their decisions, which are aligned with the *a priori* venture-outcomes (the ends).

The empirical findings as discussed in Section 5.2 fundamentally support and demonstrate that in the yin-yang universe of the conceptual O-O-P framework notion which reflects natural phenomena, the *opportunity* constituent of the IO-nexus notion *can come in various forms and manifest in different ways* (Eckhardt & Shane, 2010) for a variety of circumstances (Timmons, 1999). As Ramoglou and Tsang (2016) explain:

“... *ontological objectivity [yang] and ontological subjectivity [yin] . . . underlines the multiplicity of the modes of existence inherent in our world.*” (pp. 413, with the yin-yang characteristics juxtaposed in square parentheses).

As an initial prospect, opportunity can *inaugurate and eventuate ‘as is,’* or *evolve into something different* as the individual entrepreneur interacts with it in line with the dynamic and dialectical duality tenets of the yin-yang notion. Whichever form it becomes, opportunity is truly *a holistic*

nexus of the dualistic elements of demand and supply/product in yin or yang states interacting as root-origin (the isomorphic ends) or instrumental-means. Different *permutations* of the root-origin and instrumental-means of opportunity in the *existing* (yang) and/or *new* (yin) markets can interact with the individual entrepreneur in the IO-nexus of entrepreneurial process to form and exploit different types of opportunity-nexuses and outcomes.

The discussion of empirical findings in [Section 5.2](#) also support the notion posited by the conceptual O-O-P framework that *an opportunity's root-origin or venture-outcome is the goal post around which the processes of formation and exploitation orientate and revolve.* The root-origin can be *altered* to target a niche *segment* in the market (GutHealthCo), or *subverted* due to confidence biases (WellnessCo and PulseCo). However, it does not change the O-O-P framework's primary proposition – that is, that the *root-origin* (in its original form or as morphed) is the *defining and unifying* factor of an opportunity's venture-outcome. Equally importantly, it also orientates the entrepreneurial process. The entrepreneur therefore needs to appreciate the corresponding *reorientation* that will be necessary for the venture-outcome and the accompanying opportunity formation and exploitation processes to achieve the morphed opportunity in line with the change in the root-origin (segmented or subverted).

The *instrumental-means* to fulfill the root-origin of an opportunity can also be *streamlined* (see [Section 5.2.3.2](#)). The reason may be to bring to a solution that is much more innovative than first contemplated (LawDocCo), or to shorten the start-up phase and accelerate venture growth by pulling customer needs from the existing market to an innovative product (ExtractCo). Streamlining or changing the instrumental-means will change the ontological nature of an opportunity, and therefore require re-orienting and adjusting the epistemological process to *form* and *exploit* it.

There are many ways to form and exploit an opportunity in different yin-yang market environments. The root-origin (whether in its initial state, or after being segmented, streamlined, or subverted) defines and orientates the opportunity, the venture-outcome, and therefore the process of opportunity formation *per se*, which follows the three epistemological traditions of constructionist, evolutionary-realist, and regression. It can be noted from the empirical findings

that oftentimes, the process of *forming* and the process of *exploiting* opportunities (in and of themselves, and as between them), are non-discrete, overlap with each other, and can happen contiguously. In this connection, the Taijitu complemented by the opportunity-hexadecadrant of the O-O-P framework is an excellent tool for visualizing and rationalizing the entrepreneurial processes of how the opportunity can be formed and exploited by the entrepreneur under different yin-yang market scenarios, thereby *operationalizing* the *interaction* between the two dualistic elements in the notion of *IO-nexus* hitherto not fully described.

Regardless how an opportunity is oriented (MdO or PsO), a startup-venture can *deploy* and *orientate* a mix of functional marketing-related and production-related activities to exploit the opportunity and achieve the associated venture-outcome (see Table 5.5). *The orientations of the functional marketing and product/production related activities depend on the root-origin.* However, in the yin-yang spirit of the IO-nexus notion of interaction between opportunity and entrepreneur, *due effort* and *diligence* must be *appropriated* to *both marketing-related and production-related activities* when exploiting the opportunity to achieve its venture-outcome (see Subparagraph (b)(iv) of Section 5.4.2.3). Certain marketing and product/production related activities are *critical*, and must be *appropriately* incorporated as part of opportunity-exploitation. Thus, a startup-venture needs to be aware that being either *overly* indulgent in product/production-related activities (WellnessCo and PulseCo), or *negligent* in fact-finding (SoundCo), market-validation (SoundCo and WellnessCo), filing patent (ExtractCo), can lead to adverse business consequences and failures.

There are moderating variables that produce *contrasting conditions* in terms of deviations from the conceptual notions and explanations of the O-O-P framework. These include the following instances:

- (a) *Overconfidence biases* (overestimation and overprecision) during the *formation* stage of the opportunity subverted the root-origins of the initial constructionist opportunity-prospects that PulseCo and WellnessCo started with, and morphed the nature of their opportunities from constructionist to regression.

- (b) *Attraction* to new market prospects prompted GutHealthCo to segment the root-origin in the formation stage of opportunity, changing its nature from constructionist to creation.
- (c) *Overprecision* (overconfidence bias), which perpetuated from formation to the exploitation stage of opportunity, caused a disproportionate amount of resources being allocated to *production/development-related* activities over the marketing-related activities, and the eventual failure (e.g., WellnessCo when it ran out of cash).
- (d) *Overestimation* (overconfidence bias) led to *planning fallacy* and *illusion of control* in the formation and exploitation of PulseCo's opportunity, which caused unnecessary delays in the co-founding entrepreneurs' exit from the business.
- (e) *Naivety* of ExtractCo's entrepreneurs caused them to neglect the need for patent filing during the exploitation process, thereby sub-optimizing the business value of the opportunity being exploited.
- (f) Lack of due diligence in collating facts and market intelligence from primary sources to unravel *misinformation* due to *representativeness bias* (Busenitz & Barney, 1997) distorted the direction of SoundCo's opportunity-exploitation process. For instance, SoundCo could have formally harnessed market intelligence and primary data by using customer surveys, customer attitude surveys, and sales response in test markets. Other complementary mechanisms could have been used as well, like informal discussions with trade partners. Some of these were practiced by AudioSvcCo, BallLeagueCo, BuildMgCo, GutHealthCo, LawDocCo, MedScreenCo, SkinCo, and SysIntegrateCo.

These moderating factors are *theoretical replications* that assert the analytical generalizability, and therefore external validity, of the O-O-P framework.

Chapter 6 – DISCUSSION & CONCLUSION

This thesis applies the yin-yang philosophical paradigm to systematically rationalize and operationalize opportunity (a dualistic DS or SD nexus) and the entrepreneurial process (a dualistic IO-nexus) within the conceptual O-O-P framework to set forth a *single integrated theory* for the study of the start-up entrepreneurial phenomenon as a “distinctive domain” (Shane, 2012, p. 10). It starts with a set of research questions at the outset to guide the development of a conceptual O-O-P framework that links the opportunity’s ontological root-origin isomorphically to the *a priori* venture-outcome, and therefore the succedent processes of formation and exploitation needed to achieve it.

Having reported the results of the investigation in the preceding chapter, this final chapter contains a review of the study and its conclusions, which are structured around the original research questions. A discussion on the theoretical contributions of this thesis and its implications for research and practice then follows.

6.1. Review and discussion

6.1.1 Overview of scholarly work on entrepreneurship

New ventures drive economic development, innovation, and job creation, but the risks and potential for failure are high due to the lack of methodology for startup venturing. Extant research has sought to fill the gap by casting *entrepreneur* as the key determinant in the dualistic **IO-nexus** notion. Rationalized as a function of the “joint characteristics of the opportunity and the nature of the individual” (Shane & Venkataraman, 2000), the IO-nexus notion has dominated entrepreneurship literature since its introduction.

However, the criticality of the entrepreneurs’ role and their traits and characteristics in explaining the entrepreneurship phenomenon has not been conclusively ascertained. Hence, entrepreneur-based studies have been criticized as generally disappointing, and unable to offer sufficient *validity* or *generalizable value* (Gartner, 1990; Low & MacMillan, 1988; Roberts, et

al., 2007; Stevenson, 2006; Ucbasaran, et al., 2001). Above all, scholarly opinions differ on the definition of ‘who’ the entrepreneur is.

“[I]f one has to be the founder to be an entrepreneur, then neither Thomas Watson of IBM nor Ray Kroc of McDonald’s will qualify; yet, few would seriously argue that both these individuals were not entrepreneurs.” (Stevenson, 2006, p. 2)

6.1.2 Objective of this thesis

Heeding the calls by scholars for entrepreneurship theory to deliver the utility that research and practice need (Sarasvathy, 2001; Ucbasaran, et al., 2001; Zahra, 2007), this paper rationalizes opportunity, particularly its root-origin, as the *antecedent* that determines the *why*, *when*, and *how* of *entrepreneurial phenomenon*, which the IO-nexus notion highlights but did not elucidate (Shane & Venkataraman, 2000). In particular, this thesis deduces logically the root-origin as defining and orientating isomorphically the *a priori* venture-outcome, and in turn the *causality* relationships of the start-up entrepreneurship in the order of antecedent → ends → means (i.e., **A-E-M**), which is venture-opportunity (root-origin) → venture-outcome (the *ipso facto* root-origin to be matched) → entrepreneurial process (i.e., O-O-P). This knowledge **operationalizes** the start-up *entrepreneurial process* for the conceptual O-O-P framework and IO-nexus as a single integrated entrepreneurship theory.

Opportunity is a vital aspect of entrepreneurship (Alvarez & Barney, 2007; Buenstorf, 2007; Casson & Wadeson, 2007; Kirzner, 1997; McMullen, et al., 2007; Shepherd, et al., 2007) – it is the reason *why* a new venture is created to pursue opportunity as an “entrepreneurial event” (Bygrave & Hofer, 1991, p. 257). Without opportunity, a startup-venture lacks meaning and purpose, and the entrepreneur has no role. There is no need to start up without an opportunity. Yet if opportunity exists, explanations must be given on how it interacts with the individual as a process in the dualistic IO-nexus.

6.1.3 Research questions

To examine the role of opportunity as the driver of the entrepreneurship phenomenon, the overarching question that must be asked is:

“*How does opportunity influence the outcome and process of new venture at its start-up stage?*”

This thesis submits the conceptual O-O-P framework to answer this key research question and the sub-questions that relate to it.

The *fundamental proposition* of the framework is that the root-origin (either market-demand or product-supply) of a startup-venture’s opportunity is the *antecedent* variable that determines and *unifies* the *orientation* of its instrumental-means, the *a priori* venture-outcome, and the formation and exploitation processes.

6.1.4 Methodology/Key propositions

In order to conceptualize and deduce the core variables and their causal relationships and connections, this thesis first examines the ontology of *market-opportunity* because it is “one of the most central features of entrepreneurship research” (Davidsson, 2004, p. 28; also Drucker, 1985a; Vesper, 1991). The examination of ontology helps to explain the where, why, when, and *what* of opportunity. It also covers *what* the relevant *venture-outcomes* (the *ends*) are and *how* they are determined, *how* the opportunity is *formed*, as well as *how* the *process* of opportunity-exploitation are oriented to deliver the *instrumental-means* to achieve the venture-outcomes and fulfill the opportunities.

In this connection, this thesis submits the yin-yang duality notion as its philosophical position because it is generalizable to rationalize and explain various natural phenomena in the world, including the intrinsic ontological nature of *market-opportunity* as a dualistic nexus of the co-

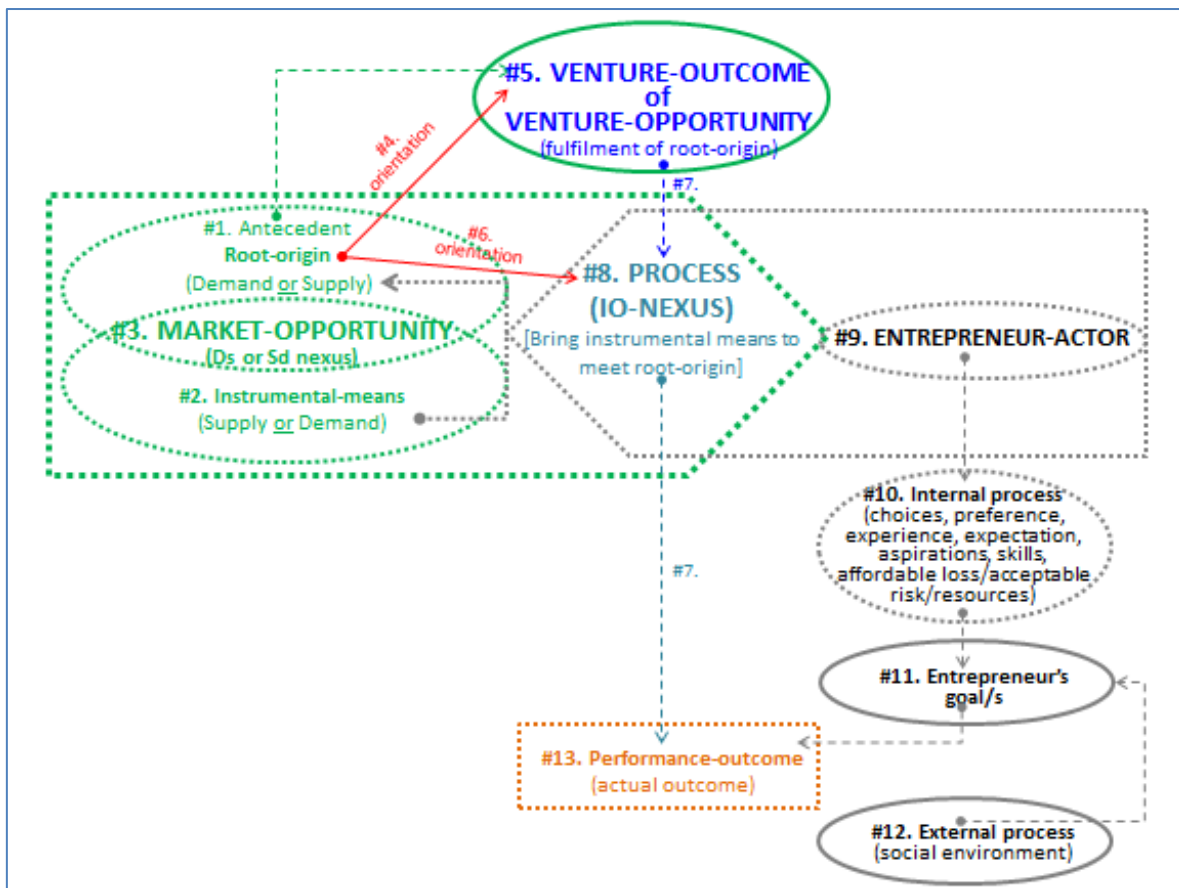
present and connected elements of *demand* and *supply* (the *what*). These two core variables interact with each other under disequilibrium conditions (the *when* and *why*) in *existing* (yang) and/or *new* (yin) market-settings (the *where*). The two dualistic elements *alternate* as the *root-origin* or *instrumental-means* (used to satisfy the cause, which ipso facto is the root-origin). This results in eight different market-opportunities (or ends-means/means-ends nexuses of DS and SD inter-relationships) with associated venture-outcomes for start-up entrepreneurial adventuring. The conceptual O-O-P framework organizes the nexuses into an *opportunity-hexadecadrant*. Six of the market-opportunities with their *a priori* venture-outcomes have shades of Schumpeterian (1934) qualities that involve innovative ‘new combinations,’ and are truly ‘entrepreneurial’ and innovative in nature (see Figure 6.2). The other two typify wholesale or retail trading opportunities which Alfred Marshall (1920) described but chose to *omit* from his formal analysis of supply and demand⁵⁹ as this research likewise dismisses.

6.1.5 Key propositions

The fundamental notion of the conceptual O-O-P framework is that entrepreneurial opportunity of a startup-venture is a dualistic nexus of demand and supply interacting as root-origin or instrumental-means under disequilibrium conditions in different market-settings or yin-yang environments. This is illustrated in Figure 3.12 reproduced in Figure 6.1 below. The *root-origin* defines the orientation (#4 in Figure 6.1) of entrepreneurial process (#8 in Figure 6.1) needed to fulfill the *a priori* venture-outcome (#5 in Figure 6.1), which is *ipso facto* the isomorphic root-origin. The causality pattern of A-E-M relationships in the conceptual framework is therefore O-O-P, where the antecedent root-origin is the orientator and unifying factor. *Ex-post* the entrepreneurial process of forming and then exploiting the opportunity, performance outcome (#13 in Figure 6.1) can differ from the venture-outcome (#5 in Figure 6.1) due to the entrepreneur’s goal/s, and internal and external influences (#10, and #11 and #12, respectively in Figure 6.1).

⁵⁹ These two opportunity-types happen only in existing market setting and are characteristically ‘arbitrage’ in nature which Schumpeter (1934) would consider as *low* level entrepreneurship.

Figure 6.1 – Conceptual O-O-P framework: ontology, outcomes, epistemological process, and IO-nexus



To develop the notion of the conceptual O-O-P framework, this thesis introduces the Chinese yin-yang duality concept to present a middle ground metaphilosophical *dualistic* perspective on various phenomena in the natural world, be it the ontological dualistic nature of opportunity with demand and supply elements, or the entrepreneurial process as a dualistic IO-nexus between opportunity and the entrepreneur. The ‘both/and’ spirit of the yin-yang duality concept removes the “limitations or flaws” (Poole & Van de Ven, 1989, p. 567) found in extant literature on entrepreneurship. They include paradoxical explanations that have arisen from the dialectical and uncompromising ‘either/or’ logic of objectivist and subjectivist positions, which make extant definitions and postulations in literature conflicting and untenable in explaining the entrepreneurial phenomenon that Shane and Venkataraman (2000) have elegantly articulated as an IO-nexus. In particular, the “theoretical tensions or oppositions” (Poole & Van de Ven, 1989,

p. 562) also make the three extant teleological approaches (discovery/positivist-realist, constructionist, and evolutionary-realist) inadequate in explaining the opportunity's formation and exploitation. To solve the dilemma, this thesis reframes them in the 'both/and' yin-yang universe of the conceptual O-O-P framework, in the course of which the regression approach hitherto not identified and mentioned in extant literature is distilled as the *fourth* epistemological tradition. Once reframed and recontextualized, the four teleological approaches are able to represent the full continuum of epistemologies that harmoniously and holistically explain the different aspects of the entrepreneurial phenomenon (i.e., *different entrepreneurial processes that relate to different opportunity-types*), thereby *operationalizing* the O-O-P framework and the IO-nexus as a single integrated parsimonious theory of start-up entrepreneurship.

6.1.6 Methodology

To evaluate the conceptual O-O-P framework, qualitative method of multiple-holistic case studies (Yin, 1994) using open-ended interviews is selected as the research method. The aim of the inquiry is to determine the coherence and consistency of the conceptual O-O-P framework's propositions and explanations. The scope of empirical research therefore covered the (a) *relationships/ associations*, and (a) *causal* connections among the O-O-P variables.

To provide specificity for the collection of empirical data, the due diligence checklist of the venture capital industry for assessing venture investments was used to distill the marketing-related and product-related functional activities. They are then operationalized as specific proxies for collating the functional marketing and product/production related activities that are actually undertaken by new startup-ventures in practice to exploit their respective opportunities and achieve venture-outcomes. They also facilitate the contextualization of orientations, either market or product.

Semi-structured, open-ended, talk-aloud interviews were conducted in a logical-positivist manner with 13 startup-ventures. As the *units of analysis*, they cover a broad range of businesses in the *high-tech industry* where Schumpeterian (1934) new combinations are most likely to happen, thereby adding rigor to this research.

6.1.7 Results

The empirical findings from the multiple-holistic case studies provide strong evidences of *literal replications* and *theoretical replications* that are *analytically generalizable* to the O-O-P framework's *conceptual propositions* and *explanations*. The findings provide answers to the research questions of this study.

6.1.7.1 Ontology of opportunity

RQ1. What is the ontological nature of entrepreneurial venture-opportunity?

The findings support the notion that opportunity is a dualistic nexus of *demand* and *supply* elements (#3 in Figure 6.1). The nature of the dualistic elements, and therefore opportunity *per se*, is explainable by the holistic, dynamic, and dialectical duality tenets of the yin-yang concept (see [Section 3.4](#)). Opportunity is an objective reality that exists, albeit its elements may be unobservable. Either element, whether as the *root-origin* (source of change per Figure 3.5, and isomorphic ends or venture outcome) or *instrumental-means* (Figure 3.5), interact with the other under disequilibrium conditions in different market-settings or yin-yang environments, to yield various yin-yang configurations of opportunities manifesting different degrees of *observability* (Figure 3.6 and Figure 3.19), knowability, and detectability.

Of interest to this thesis are eight different possible DS and SD interactions or nexuses of *market-opportunities* that can be represented by the opportunity-cells of the conceptual O-O-P framework's opportunity-hexadecadrant (Figure 3.4). They are categorizable into the four different types of opportunity, three of which (i.e., discovery, constructionist, and creation) are mentioned in extant literature, and a fourth type (regression) identified by this thesis (see Figure 3.6). Each opportunity-*type* is formed by a specific epistemological process, and can be associated with a certain level of entrepreneurship and innovation effort bearing a unique risk and/or uncertainty profiles (see various sub-sections under [Paragraph \(C\) of Section 3.5.2.3](#) and [Paragraph \(D\) of Section 3.5.2.3](#)). Moreover, each *individual* opportunity has an orientation that is either MdO or PsO, depending on its root-origin (see Figure 3.11).

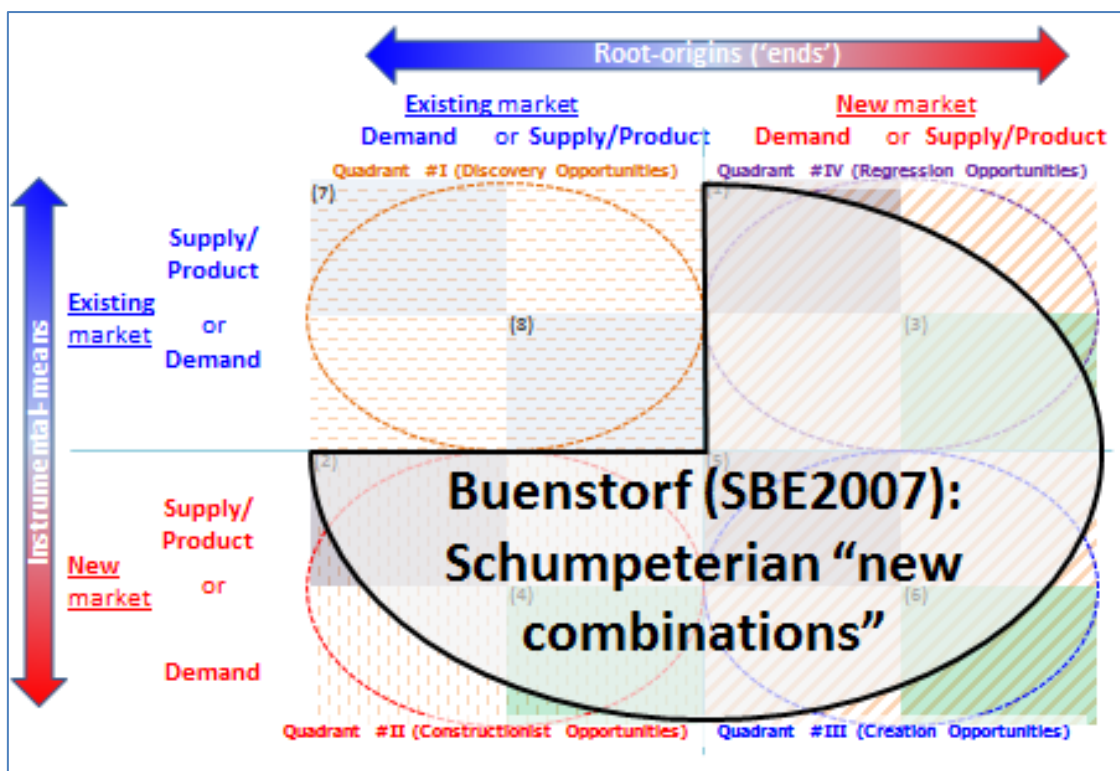
6.1.7.2 Types of opportunity

RQ2. What are there different types of start-up entrepreneurial venture-opportunity?

A venture-opportunity, or entrepreneurial opportunity, can be rationalized as a subset of the broader market-opportunity, which is a yin-yang configuration comprising demand, and supply elements (see Paragraph (A) of Section 3.5.2.3). The empirical case-data do support the notion that there exist different 'types' of venture opportunity in practice (see Figure 5.1), according to the conceptualized categories of the O-O-P framework in Figure 3.6.

As mentioned in Paragraph (A) of Section 3.5.3.4 and Section 4.4.2 (and footnote 36), this thesis is concerned with the six opportunities of types categorized in Quadrants II (constructionist), III (creation), and IV (regression) in Figure 6.2's opportunity-hexadecadrant that are characteristically Schumpeterian (1934) new combinations as Buenstorf (2007) would also interpret.

Figure 6.2 – Schumpeterian new combinations (quadrants II, III, and IV)



The other two discovery opportunities in Quadrant I of Figure 6.2's opportunity-hexadecadrant are excluded from the scope of this research. They are either less entrepreneurial or not entrepreneurial at all (Marshall A. , 1920) because they pertain to arbitrageable opportunities in the retail and wholesale industries that are characteristically arbitraging in nature. In fact, Schumpeter (1934) says that the level of entrepreneurship involved with these opportunities are 'low,' while Shane (2012) opines that *no* entrepreneurship is involved because little effort is required to recombine resources (see Paragraph (A) of Section 3.5.3.4).

6.1.7.3 Formation and evaluation of opportunity

RQ3. How are the various types of start-up entrepreneurial venture-opportunity formed and evaluated?

As discussed in Section 5.3, the case interviews covering constructionist, creation, and regression opportunities show that the formation epistemologies do follow the constructionist, evolutionary-realist, and regression traditions respectively as explained in Section 3.5.3.4. The constructionist and evolutionary-realist approaches have been discussed quite extensively in extant literature (see Paragraph (B). of Section 2.6.3.2 and Paragraph (C) of Section 2.6.3.2), while the regression approach is identified and conceptualized by this thesis in Paragraph (E) of Section 3.5.3.4. Empirical findings also reveal the orientation of epistemological process taken to form and evaluate an opportunity by the individual start-up cases interviewed as being either MdO or PsO, depending on the root-origin of their respective opportunity (see Section 5.3.1).

6.1.7.4 Venture-outcomes, and their formation and orientation

RQ4. What are some of the relevant venture-outcomes for the various types of start-up entrepreneurial venture-opportunity?

Based on empirical data, the venture-outcomes entail either bringing/pushing product-supply to meet market demand, or bringing/pulling market demand for the product-supply (Figure 3.11).

RQ5. How are the venture-outcomes for the various types of start-up entrepreneurial venture-opportunity formed?

The venture-outcome is *ipso facto* related to and determined isomorphically by the *root-origin* of the venture-opportunity as conceptualized by the O-O-P framework, and hence can be determined on an *a priori* basis. While the initial root-origin may be segmented or subverted, the ‘new’ or ‘quasi’ root-origin (as segmented or subverted) remains the object to be fulfilled and satisfied as the venture-outcome (see Sections Paragraph (B)(3) of Section 5.3.2.1, Paragraph (B)(4) of Section 5.3.2.2, and Paragraph (B)(3) of Section 5.3.2.3).

RQ6. How do the venture-outcomes get oriented and prioritized?

The empirical results support the conceptual O-O-P framework’s proposition that the venture-outcome is oriented by the opportunity’s *root-origin*, whether initial, segmented, subverted, or streamlined (see preceding paragraph). In respect of the particular opportunity of an individual startup-venture, it is oriented by the root-origin and therefore either *MdO* to bring/push product-supply to meet market demand, or *PsO* to bring/pull market demand for the product-supply (see Sections 5.4.2.1 and 5.4.2.2, and Figure 3.11).

6.1.7.5 Exploitation of opportunity and its orientation

RQ7. What are the actions and processes taken in connection with the respective venture-outcomes?

As the empirical findings show, the exploitation of an opportunity can involve a gamut of functional marketing-related and product-related activities (see Table 5.5 for a non-exhaustive listing) that are non-discrete, happen *contiguously*, and often *overlap* with each other.

RQ8. How does the entrepreneurial process get oriented?

The empirical findings support the conceptual O-O-P framework’s notion that the *root-origin orientates* the functional marketing-related and product-related activities for the entrepreneurial

process of exploiting the opportunity (see [Section 5.4.2](#)). They are therefore MdO or PsO, depending on whether the root-origin is triggered by demand or product-supply sources of change.

6.1.7.6 Moderating factors in the opportunity-adventuring process

RQ9. What are the factors that might moderate or change the venture-outcomes and the entrepreneurial process taken to achieve the venture-outcomes?

The research study reveals a number of moderating factors (see [Section 5.5](#)), which include overconfidence biases manifesting as overprecision (WellnessCo) and overestimation (PulseCo), attraction to new market prospects (GutHealthCo), naivety (ExtractCo), lack of due diligence to unravel misinformation from representativeness bias (SoundCo), and so on. These moderating factors explain deviations from the O-O-P framework's conceptualized notions (e.g., in regard the epistemological formation and exploitation processes), which ultimately cause the performance-outcome to digress from the venture-outcome (see Figure 6.1). The moderating factors therefore provide the contrasting conditions for *theoretical replications* that help to assert the *analytical generalizability* and therefore *external validity* of the O-O-P framework.

It should also be noted that the pressure of time can cause performance-outcomes to deviate from venture-outcomes. [Section 4.4.2](#) mentions that there is *time pressure* in the high-velocity environment (Payne & Bettman, 2007) where high-technology startup-ventures operate, because of the need to avoid the potential opportunity cost of delayed decisions. In the case of SoundCo, the time pressure came from angel investors who provided seed capital. The pressure to market and sell its product overwhelmed the need to ensure that its product is ready for market launch, leading to adverse consequences for SoundCo.

"[O]nce [the company] get[s] an angel investment on board, you're actually on an investment story from then on. That actually becomes the only thing that the business is doing. And that can actually destroy the business opportunity. Because either you run too fast, you don't validate market." (SoundCo)

A startup-venture needs to be wary of such distractions and secure a shared vision on the prioritization and timing of its go-to-market activities *before* accepting investors' money.

6.1.7.7 Key research question

Key RQ: "How does opportunity influence the outcome and process of a new venture development at the start-up stage?"

Taken cumulatively, the *empirical* findings verify the *conceptual* propositions and explanations of the O-O-P framework in complementing and operationalizing the IO-nexus notion as a single integrated theory on the start-up entrepreneurial phenomenon. Specifically, opportunity is a dualistic nexus *formed* by demand-supply interactions in various market-settings (yin-yang environments). The *root-origin defines* and *orientates* the *a priori* venture-outcome around which the processes of bringing the instrumental-means to form and exploit the opportunity revolve.

Different opportunity-types or *yin-yang configurations* (and therefore venture-outcomes) exist, which include discovery, constructionist, creation, and regression nexuses of demand and supply. As Ramoglou and Tsang (2016) also concede and remind from their realist perspective:

"Entrepreneurial opportunities must have vast ontological differences compared with the crude propensities of the natural world." (p. 417)

In this connection, the yin-yang notion articulates and describes the *nature* of opportunity's ontological *existence* as a *holistic, dynamic, and dialectic duality phenomenon*, whereas extant discovery/positivist-realist, constructionist, and evolutionary-realist philosophical perspectives are unable. Equally important, the different DS or SD nexuses of opportunity are associated with *different epistemologies* of formation and exploitation in the IO-nexus of entrepreneurial process, like positivist-realist, constructionist, evolutionary-realist, and regression respectively.

6.1.8 Summary of results

Summarizing the empirical findings from the multiple holistic case studies, the A-E-M causal relationships of the start-up entrepreneurial phenomenon follows the O-O-P proposition and explanations of the framework conceptualized by this thesis. The graphical view of conceptual O-O-P framework in Figure 6.1 depicts relationships and connections among the variables of the start-up entrepreneurial phenomenon. In essence, the ontological root-origin determines the orientation of an opportunity and its venture-outcome (end or effect), which in turn orientates the formation and exploitation process to fulfill the opportunity by bringing the instrumental-means to meet the root-origin. There are however, sources of moderating variables (#10, #11, and #12 in Figure 6.1) that can cause the *ex-post* actual performance-outcome to deviate from the *a priori* venture-outcome

6.2 Quality assessment and assurance of the conceptual O-O-P framework

6.2.1 Quality assurance

This thesis examines 13 case studies with in their 13 initial opportunities and five morphed variants. The research was done within a multiple holistic case research to address the topics that relate to the start-up entrepreneurial phenomenon, such as the ontological nature of opportunity, the multiple types of opportunity, as well as the *a priori* venture-outcomes, and the orientation of the epistemological formation and exploitation processes taken to achieve them.

6.2.2 Nature of knowledge and verified notions

This thesis uses the logical-positivist research paradigm and meets the *inquiry aim* of verifying the *explanations* and cause-effect linkages offered by the conceptual O-O-P framework on the start-up entrepreneurial process posited as a dualistic IO-nexus. Empirical findings from the 13 start-up venture-cases with their 13 initial and five morphed opportunities are consistent with the

conceptual O-O-P framework's explanations. In aggregate, the findings provide compelling and analytically generalizable support for the causality connections and orientations among the set of core antecedent and succedent variables as conceptualized.

In a sense, the conceptual O-O-P framework provides “classical [as opposed to probabilistic] determinism” (Bygrave, 1993, p. 258) that *operationalizes* it for “prediction and control” (Guba & Lincoln, 1994, p. 113).

“The critical test of any theory is its ability to predict future outcomes with accuracy.”
(Bygrave, 1993, p. 260).

In this connection, the empirical findings do provide the literal and theoretical replications that are analytically generalizable to support the predictive power inherent in propositions of the conceptual O-O-P framework. For instance, whereas hitherto it may not be obvious to the entrepreneur using common sense, he/she can now infer from the framework the predictable consequence of following or not following its propositions. Thus, if the startup-venture does not align the processes of forming and exploiting an opportunity with the root-origin's orientation for whatever the reason (e.g., on account of the moderating factors), the *a priori* venture-outcome and opportunity *per se* are unlikely to be achieved. Therefore, the conceptual framework allows generalizations and cause-effect linkages to be made with predictable confidence to a population of new ventures in start-up settings (Guba & Lincoln, 1994).

6.2.3 Goodness or quality criteria

The research findings meet the conventional benchmarks of ***rigor*** in terms of objectivity, internal and external validity, and reliability. The empirical findings are *objectively* gathered from case interviews and the conclusions are *free from bias* (Guba & Lincoln, 1994) since the open-ended interview approach is used in the *data collection phase* as the basis of *dualistic* and *objectivistic* line of inquiry. The status of the interviewer as a “distanced and neutral observer” (Guba & Lincoln, 1994, p. 114) is kept, thereby ensuring the isomorphism of findings with objective reality and the ***construct validity*** of the conceptual O-O-P framework. It also enhances the

reliability and overall *quality* and *trustworthiness* of this research. Moreover, the *subjective opinions* of the researcher (even as the instrument of interview) are *not involved*; his personal *values/influences* are also *denied* because the conceptual framework is able to provide a complement of *operationalized* terminologies and dimensions to *objectively* inform and investigate the research questions on the opportunity-adventuring phenomenon.

Within and across the case-findings, *literal replications* and contrasting patterns of *theoretical replications* respectively are demonstrated. The literal replications validate the conditions under which the start-up entrepreneurial processes happen as notionalized by the conceptual O-O-P framework. They assert the *internal validity* of the conceptual O-O-P framework in terms of its explanatory power and consistency. The theoretical replications highlight contrasting conditions for predictable reasons when the conceptual O-O-P framework's propositions are not likely to be found. Together with their literal counterparts, the theoretical replications help to generalize the findings to the conceptual O-O-P framework, thus helping to strengthen its external validity. Furthermore, the replication logic evident in the 13 initial and five morphed opportunities for the 13 startup-venture cases lend support to the reliability of the conceptual O-O-P framework – that is, that the research results are *stable* and *repeatable* by another inquirer using the data collection as documented herein (Guba & Lincoln, 1994; Yin, 1994).

Replication can be claimed as all the case studies are shown to support the conceptual O-O-P framework (Yin, 2009). Consequently, the empirical results can be considered as “potent” (Yin, 2009, p. 39), so that there is no need for a rival theory.

6.3 Theoretical contributions, and implications for research and practice

The task of developing a single integrated theory may seem insurmountable, given the theoretical tensions that exist in extant seminal works. Nevertheless, this thesis demonstrates that studying the start-up entrepreneurial phenomenon is a far richer area than it hitherto has been. In this connection, this thesis contributes to literature and practice in several ways.

6.3.1 Conceptual O-O-P framework and IO-nexus as an integrated entrepreneurship theory

This research systematically deduces and establishes key insights for its conceptual O-O-P framework to operationalize the IO-nexus as a notion (Venkataraman, 1997) that explains the entrepreneurial process of startup-ventures. It aligns with the calls by various scholars for more contextual and process-oriented research as an important advancement to the study of entrepreneurial phenomenon (Kuckertz, 2013; Low & MacMillan, 1988; Ucbasaran, et al., 2001).

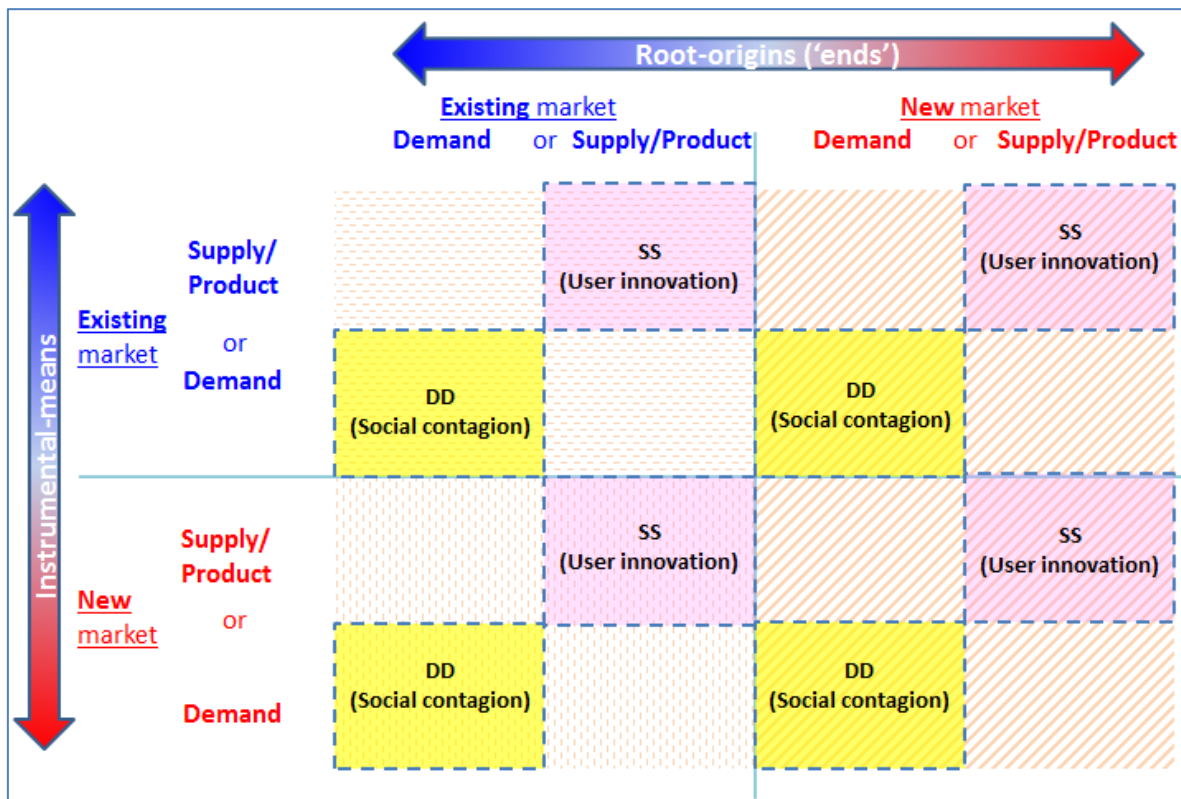
Hitherto, little is known about the variables and process of start-up entrepreneurial phenomenon that constitute the foundations for the theory of entrepreneurship. Knowledge regarding the phenomenon is typically accumulated by subjective induction, which relies on data gathered only *after* the firms have successfully started (Aldrich, 1999).

In contrast, this thesis is able to provide notions that explain the start-up entrepreneurial phenomenon on an *a priori* basis. This is systematically done by *first* applying the *duality* tenets of the yin-yang philosophical position to reframe and recontextualize conflicting, and even paradoxical, observations, perspectives, definitions, and explanations found in extant literature. In the yin-yang universe of the conceptual O-O-P framework, they *then* become part of the notions that explain the various aspects of entrepreneurship in a logical and coherent manner. These aspects include the yin-yang ontology of opportunity as a *dualistic DS or SD nexus*, their *a priori* venture-outcomes, the teleological approaches to the epistemological formation and exploitation of different types of opportunities in the *dualistic IO-nexus*, and the orientations and causality linkages among them. Finally, multiple holistic case study research based on a logical-deductive approach is then conducted to provide *empirical* findings that support the analytical generalizability of the *conceptual* notions. The conceptual O-O-P framework so developed for the IO-nexus notion therefore holds promise as a compelling *a priori* single integrated theory that explains the ‘*what*’ and the ‘*how*’ of new venture-creation process.

6.3.2 The opportunity-hexadecadrant as an integrative visualization tool

In developing the conceptual framework, this thesis introduces the *opportunity-hexadecadrant* as a parsimonious tool operationalized to help visualize and rationalize at least 2^4 or 16 different opportunity-nexuses of ends-means/means-ends inter-relationships (Figure 3.3). Eight of them are market-facing DS or SD nexuses of dualistic demand and supply forces in the *product markets* where the entrepreneur provides goods and services to market consumers (Figure 3.4). Of these, six are Schumpeter market-opportunities analyzed by this thesis (Figure 6.2). The other eight DD and SS nexuses (see Figure 6.3, which is an extract of Figure 3.3) can be used for future research on inter-consumer influences (e.g. social contagion, such as through social media channels) and inter-supplier dynamics (Von Hippel, 1986). These DD and SS nexuses are beyond the scope of this thesis.

Figure 6.3 – Supply-supply and demand-demand relationships



6.3.2.1 Understanding sources of change and ‘type’ of opportunity

One of the several contributions in developing the conceptual O-O-P framework is the use of the opportunity-hexadecadrant as a visualization tool to provide insight on the sources of change manifesting through the demand or supply root-origins that trigger different opportunities (Figure 3.5). These changes include the Druckerian endogenous and exogenous sources of innovative changes, and the Schumpeterian type of inventions (Bhave, 1994; Davidsson, 2004; Drucker, 1985b; Schumpeter, 1934; Van de Ven, 1986; Von Hippel, 1982). *Most importantly, the sources of change can have different yin-yang states/manifestations.*

6.3.2.2 Understanding the special role of root-origin and causality pattern

The other purpose served by the opportunity-hexadecadrant is in the deduction of the root-origin as the antecedent that defines the *orientation* of opportunity, the *a priori* venture-outcome, and entrepreneurial process taken to form and then exploit opportunity (Figure 3.11). In particular, the opportunity-hexadecadrant highlights the unique role of root-origin in defining the order of causality connections as $O \rightarrow O \rightarrow P$, as antecedent \rightarrow ends \rightarrow means. Depending on the nature of root-origin, the causal relationship can be MdO or PsO.

6.3.3 Types of opportunity and ‘regression’ as a new teleological approach for opportunity formation and exploitation

The quadrants of opportunity-hexadecadrant categorize opportunities into four different types. Each opportunity-type is associated with a certain level of entrepreneurship, innovation, and risk-uncertainty (Figure 3.6). Furthermore, each opportunity-quadrant can be related to one of the four teleological approaches that explain the epistemological process of forming and exploiting opportunities within the market scenario that they reside. Three of the teleological approaches (discovery/positivist-realist, constructionist, and evolutionary-realist) have been systematically described in the literature (Alvarez & Barney, 2007). The opportunity-hexadecadrant identifies a fourth (regression) approach, which epistemological process is rationalized with the help of the

Taijitu (see Paragraph (E) of Section 3.5.3.4) to explain the epistemological formation and exploitation process of regression opportunity as a new and distinctive type of opportunity hitherto *overlooked* by entrepreneurship scholars. The addition of regression epistemology makes the conceptual O-O-P framework holistic in terms of having four teleological approaches that are not mutually exclusive, but integrated to explain how opportunities with different ontological natures that co-exist in the natural yin-yang universe are formed and exploited.

6.3.4 Opportunity-hexadecadrant for strategic planning and actions

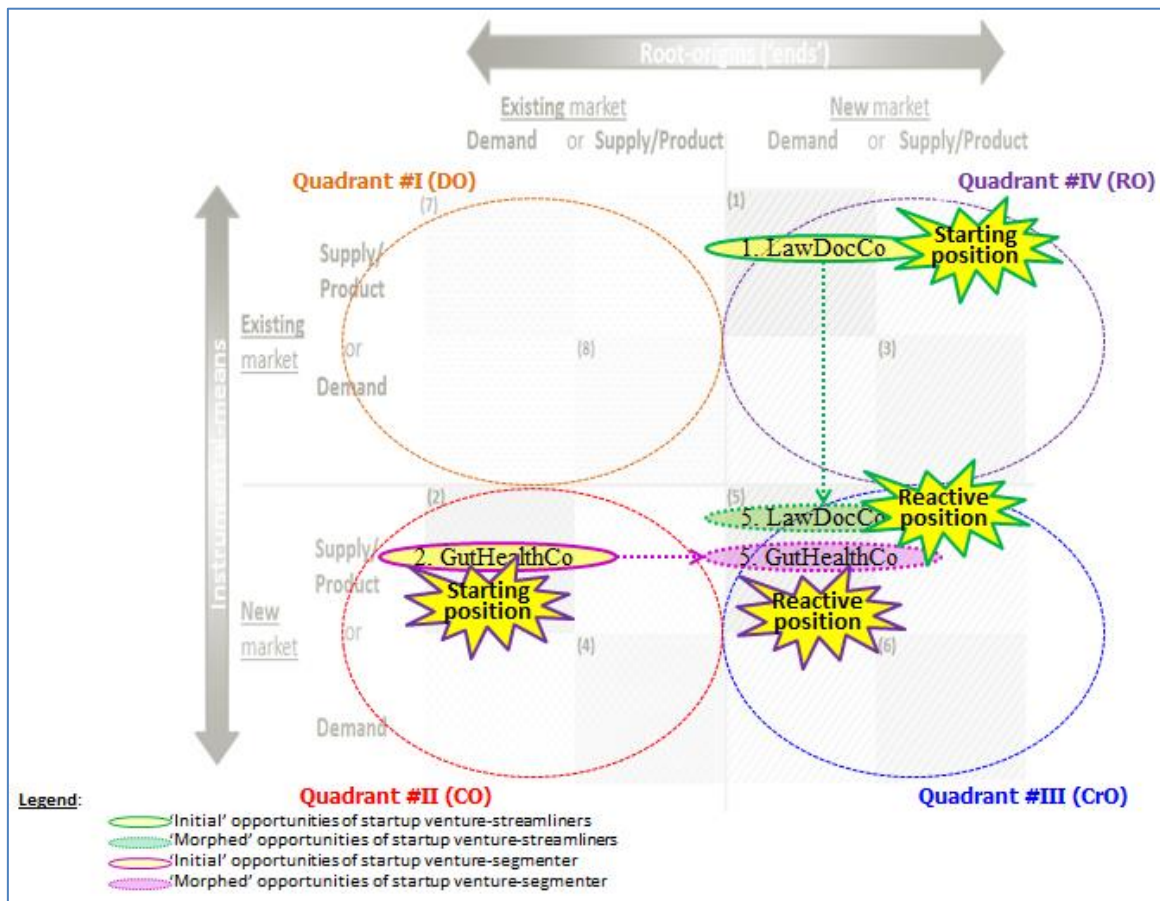
The opportunity-hexadecadrant can also serve as a strategic planning tool to help startup-ventures to fashion market positioning, competitive response (Payne & Bettman, 2007), innovation, and business strategies.

6.3.4.1 Market-positioning

As the empirical findings reveal, entrepreneurial venture-opportunities are not always ‘discrete’ or exist in a vacuum. They *evolve* over time and space (tenet of dynamic duality).

For example, an entrepreneur (as in the case of LawDocCo) perceiving a new demand as the trigger for a prospective market-opportunity can consider two possible instrumental-means to fulfill the perceived new demand, either existing products/services (Cell 1 of Figure 6.4) as a regression opportunity, or innovative new products/services (Cell 5) as a creation opportunity. Likewise, an entrepreneur (as in the case of GutHealthCo) envisioning to bring a new product/service as a creation opportunity in a new market segment (Cell 5 in Figure 6.4), rather than trying to push it to pursue a constructionist opportunity in the general market (Cell 2). Both these ventures are examples of how the opportunity-hexadecadrant can be applied for market-positioning strategies.

Figure 6.4 – Non-discreteness of opportunity



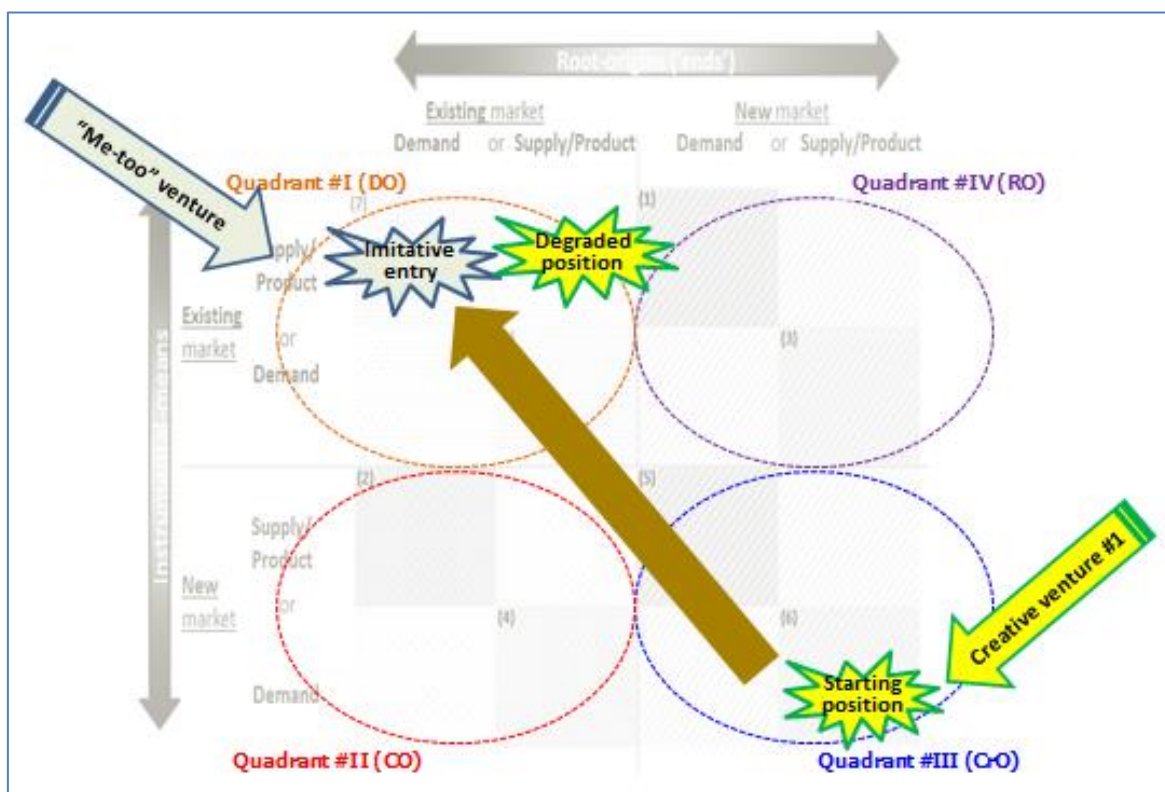
6.3.4.2 Competitive response

Entrepreneurship conditions are never at “rest” (Metcalf, 2009, p. 13). For researchers and practising entrepreneurs, the opportunity-hexadecadrant functions as a useful reminder that opportunities are dynamic. In fact, the opportunity-hexadecadrant can be used to visualize and analyze the dynamics of opportunity on at least three levels.

First, a startup-venture can use the opportunity-hexadecadrant to map the evolution (either mutation or degradation) of its opportunity *over time*. Venture #1 may have started with a creation opportunity (Cell 6 of Quadrant III in Figure 6.5) to bring an innovative product to a brand new market. The activities of Venture #1 may attract the attention of a ‘me-too’ venture that reacts by mimicking Venture #1’s product idea, which from imitator’s perspective is an

‘existing’ product in an existing market (albeit created by Venture #1). The opportunity that the ‘me-too’ venture pursues is thus ‘discovery’ in nature (Cell 7 of Quadrant I). The market entry of the ‘me-too’ Kirznian imitative-entrepreneur therefore *degrades* Venture #1’s opportunity from being creation (Cell 6 of Quadrant III) to discovery (Cell 7 of Quadrant I) as shown by the dark brown arrow. For Venture #1, its initial creation opportunity is “transient due to external factors” (Eckhardt & Shane, 2010, p. 54).

Figure 6.5 – Evolution/mutation/degradation of opportunity induced by imitative entry



Second, and following from the preceding paragraph, the opportunity-hexadecadrant is useful to entrepreneurs, researchers, and policy-makers for examining at the *firm* and/or *market/industry* level the *duration* (Shane & Venkataraman, 2000) and *lifecycle* (Eckhardt & Shane, 2010) of startup-venture with a given type of opportunity. In general, the faster the *pace at which imitation and competing innovations* enters the market, (a) the *quicker* will be the *erosion* of the

extraordinary *profit* inherent in the innovation, and (b) the *shorter* will be the duration and lifecycle of any given opportunity (Shane & Venkataraman, 2000; Eckhardt & Shane, 2010).

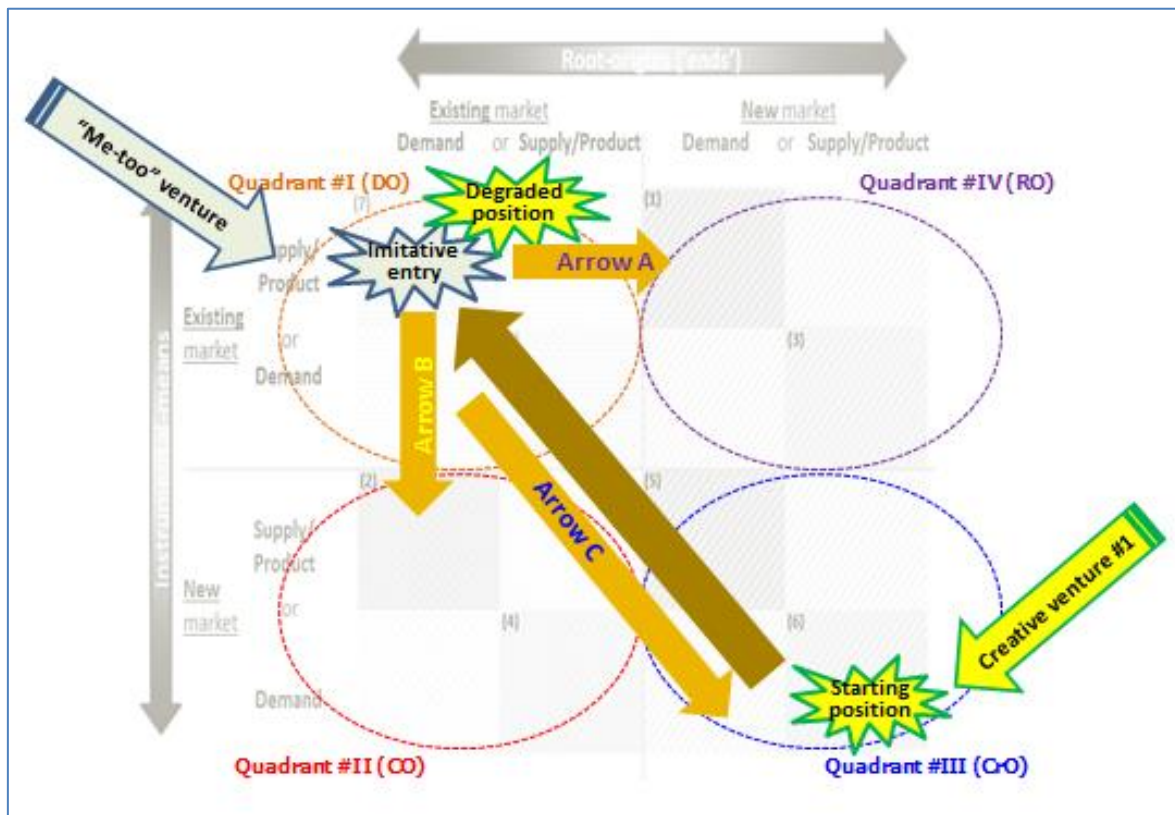
“If imitation is instantaneous, then no surplus [rent] will result.” (Amit, Glosten, & Muller, 1993, p. 826).

Factor costs may also increase as information about the opportunity diffuses to the upstream resource owners who see the prospect of increased demand from new entrants in the downstream market. To sustain profits and prolong the opportunity’s duration, the entrepreneur will need to implement strategic changes (e.g., filing patents and copyrights).

The *third* way to use the opportunity-hexadecadrant is in the area of deciding the competitive response to imitative entry. In this connection, Venture #1, which has its original opportunity degraded by the ‘me-too’ competitor, can opt to move to another new market. It can react (see Arrow A in Figure 6.6 below) by forming a regression opportunity (Cell 1 of Quadrant IV) for its product, which by then would no longer be the innovative product it once was, but became an ‘existing’ product replicated by the ‘me-too’ venture.

Alternatively, Venture #1 can adopt competitive strategies that are ‘*more neutral*,’ with the aim of preserving the market position and economic rents through continuous innovation. For instance, Venture #1 may choose to innovate a brand new product (see Arrow B in Figure 6.6), and form a constructionist opportunity (Cell 2 of Quadrant II) for demand in a market which by then is no longer ‘new’ but ‘existing’ *ex-post* the entry of the me-too venture. Venture #1 can also try to keep its incumbent creationist status by creating new opportunities (Cell 5 of Quadrant II) for new products coming on-stream from *continuous* innovation to stimulate ‘new’ demand in the marketplace (Arrow C in Figure 6.6). This action by the Venture #1 is, in the Schumpeterian’ (1934) sense, a ‘*creative destruction*’ to the market.

Figure 6.6 – Response to imitative entry



There are strategic defensive actions that creation Venture #1 can practise as well to prolong the ‘duration’ of its opportunity by creating “impediments to imitation” (Amit, et al., 1993, pp. 826). These impediments may include, *inter alia*:

- (a) selecting an appropriate mode to enter the market (Amit, et al., 1993);
- (b) slowing the rate of information diffusion (Shane & Venkataraman, 2000) by preserving private information, such as maintaining trade secrecy (Eckhardt & Shane, 2010, p. 54), and generating “causal ambiguity [as] commonly discussed in the resource-based view of strategy” (Eckhardt & Shane, 2010, p. 54);
- (c) “developing a bundle of firm-specific assets that are rare, durable, not easily transferred, and valued by customers” (Amit, et al., 1993, p. 826); and

- (d) creating monopoly rights, e.g., using patent protection (Shane, 2001) or exclusive contracts (Shane & Venkataraman, 2000; Eckhardt & Shane, 2010).

Venture #1 can also consider offensive strategic action like litigating against infringements of intellectual property rights as a radical form of retaliatory action (Davidsson, 2004), and/or using some of the 4Ps of marketing strategies to protect market integrity.

6.3.4.3 'Degree of competitive innovation'

As shown in Figure 3.6, entrepreneurial opportunities are *located* within different opportunity-cells of the opportunity-hexadecadrant. These *locations* or *settings* actually reflect the respective differences of the entrepreneurial opportunities in terms of their ontologies and antecedent sources of change, epistemologies, orientations (market and product), innovativeness/novelty, and even their risk-uncertainty profiles. Such *settings* provide the structure for researchers, entrepreneurs, and policy makers to determine the *degree of competitive innovation/novelty* of entrepreneurial opportunities that are undertaken by different startup-ventures at either the firm level or the country level. In this connection, the degree of competitive innovation/novelty in the context of the opportunity-hexadecadrant is a *continuum* notion. Once the ontological nature of a startup-venture's opportunity is ascertained, researchers and entrepreneurs alike can insert it into the appropriate opportunity-cell of the opportunity-hexadecadrant. The *profile* of the startup-venture can then be compared against other venture firms with opportunities that are located in the same or a different opportunity-cell, in terms of its *degree* of innovation, its market-relatedness, the type of innovation it brings, the risk and uncertainty involved, and its product or market orientation.

6.3.4.4 Innovation development and planning

As Figure 3.5 indicates, the respective opportunity-*quadrants* are *associated* with different *sources* of innovations mentioned in extant literature. The *general* association of the source/s of innovation with different opportunities can in fact be further finetuned by defining for *each*

individual opportunity-cell the *specific* types of innovation that may be relevant. The opportunity-hexadecadrant can then be used by researchers and policy-makers to determine at the *macro* level how different types of innovation can help to promote the growth of particular opportunity types, and/or translate them into the types of venture-opportunity that the country may need. Such analysis can form the basis for *resource allocation*.

6.3.4.5 Level (or degree) of entrepreneurship

Much has been said about the need for a ‘level (or degree) of entrepreneurship’ notion in seminal work (Metcalf, 2009; Schumpeter, 1934), but very little if any is done to integrate (and much less to establish) it in the body of research work (Davidsson, 2004). In this connection, the opportunity-hexadecadrant of the conceptual O-O-P framework provides the structural basis to address the ‘*level of entrepreneurship*’ as a notion.

The entrepreneurial *startup-venture* in the context of the conceptual O-O-P framework represents an undertaking in respect of an entrepreneurial *venture-opportunity*. The *level* of a startup-venture’s entrepreneurialism is therefore defined by the entrepreneurial opportunity being pursued, and ultimately the underlying characteristics of innovation, and risk-uncertainty that define the opportunity itself. However, the level of entrepreneurship can additionally be determined and influenced by the entrepreneurial opportunity’s orientation (whether market or product). It can be reasoned for instance that the level of complexity in bringing/pushing a product to market in an MdO situation is arguably different from trying to bring/pull a market to the product in a PsO setting. The latter is generally considered relatively more challenging.

In this connection, the opportunity-hexadecadrant facilitates the determination of the level of entrepreneurship by referring to the *location* or *setting* of the opportunity-cell that represents the startup-venture’s entrepreneurial opportunity. As Figure 3.6 shows, each of the opportunity-cells within the opportunity-hexadecadrant has a unique ‘DNA’ profile, encompassing various factors like its ontology and antecedent root-origin (source of change), the venture-outcome, epistemology, innovation, risk-uncertainty dimension, and even orientation (either market or

product). These factors concertedly define the level of entrepreneurship needed by a startup-venture for its opportunity.

6.3.4.6 Understanding Ansoff Matrix

The Ansoff Matrix (Ansoff, 1957) shown in Figure 6.7 is well known in strategic management literature.

Figure 6.7 – Ansoff Matrix

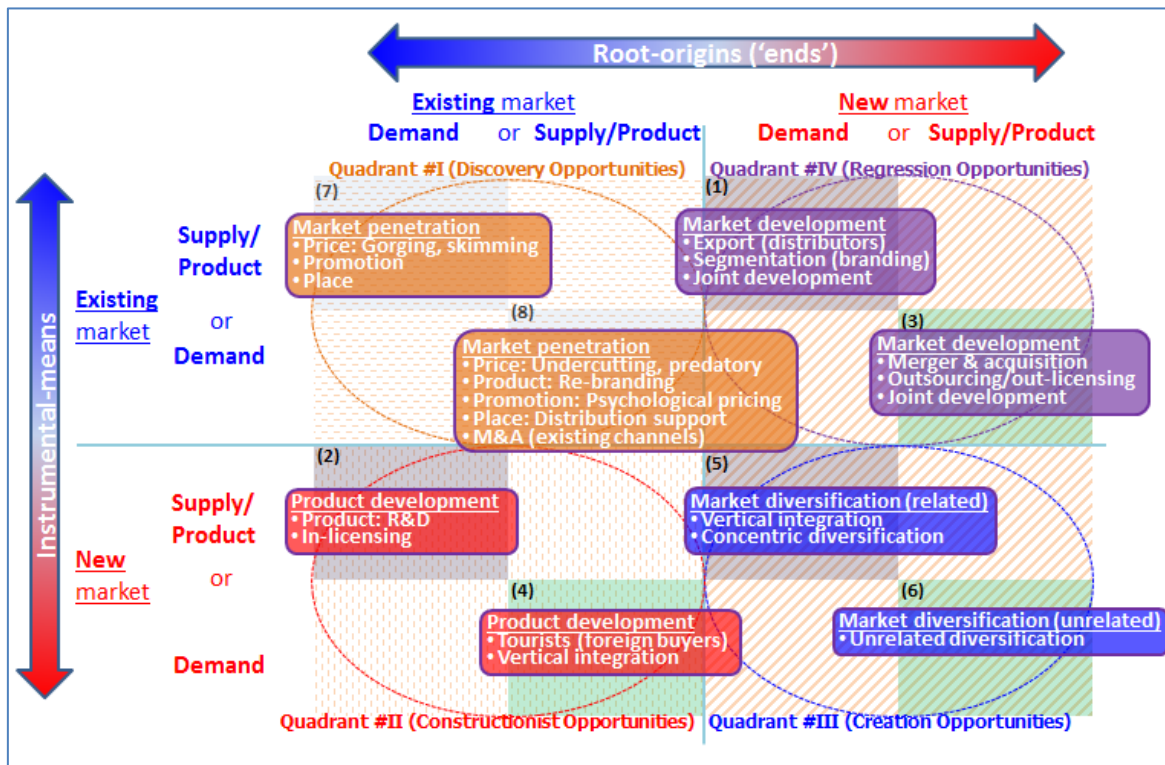


Source: https://en.wikipedia.org/wiki/Ansoff_Matrix

The notions shown in Figure 6.7's Ansoff Matrix can in fact be rendered into the opportunity-hexadecadrant (see Figure 6.8) to draw deeper and more meaningful insights for strategic planning by managers, corporate planners, and marketers. Re-rendering the Ansoff matrix can also assist researchers to map and devise strategies for a startup-venture to grow. In particular, the suite of strategic management tools that is commonly used can be incorporated into the

opportunity-hexadecadrant to facilitate decision-making. These tools include SWOT-analysis, PEST⁶⁰ analysis, Boston Matrix⁶¹, Porter's Five Forces analysis⁶², and force-field analysis⁶³.

Figure 6.8 – Ansoff Matrix in Opportunity-hexadecadrant



6.3.5 Benefits

In his empirical study on entrepreneurial venture creation, Bhavé (1994) draws the following comment from Roure and Keeley (1990), and Roure and Maidique (1986):

⁶⁰ PEST looks at the macroeconomic environment factors encompassing political and legal, economic, social and technological factors.

⁶¹ It is a method of analysing the product portfolio of a business in terms of market share and market growth.

⁶² The framework looks at the competitive structure of the industry where a venture operates in terms of barriers to entry, power of buyers, power of suppliers, threat of substitutes, and competitive rivalry.

⁶³ Force field analysis is a technique used to identify and analyze the positive/driving and negative/ restraining factors that support and constrain a decision respectively.

“Every venture also was located at a certain point on an evolving industry structure and trajectory, and the dynamics of that industry structure created for the venture certain opportunity windows, advantages, and risks.” (Bhave, 1994, pp. 230, 232)

As may be noted from the foregoing discussion, the conceptual O-O-P framework provides the fundamentals of yin-yang philosophical paradigm, the Taijitu, and the opportunity-hexadecadrant as visualization and rationalization tools. The framework also provides concepts and notions that are operationalized to benefit numerous parties in many areas. They include, but not limited to, the following:

- (a) entrepreneurs, for strategic decision-making and operational management such as market or product positioning, cross-border expansion, and competitive response;
- (b) entrepreneurs, investors, and researchers, for assessing risk, valuation, degree of innovation, and level of entrepreneurship;
- (c) researchers and policy-makers, for industry planning and analysis;
- (d) policy-makers, when allocating grants, subsidies, and other incentives, as well as creating the environment to promote innovation and entrepreneurship; and
- (e) teachers, for instruction.

6.4 Limitations and areas for improvement

This research has some inherent limitations. This thesis has kept an open-mind by introducing the Chinese yin-yang duality concept as its metaphilosophical position to the world of entrepreneurship literature, which is very ‘western.’ As this research demonstrates, the yin-yang philosophy is able to account for phenomena in the natural world that hitherto cannot be satisfactorily explained by western dialectical thinking without creating paradoxes and conflicting interpretations. In particular, the yin-yang duality notion adds significant analytical richness to the understanding of opportunity as well as the process of its interaction with the

enterprising individual. Both *opportunity* and the entrepreneurial *process, per se*, are by nature dualistic and thus explainable by the yin-yang duality tenets (holistic, dynamic, and dialectic). The yin-yang philosophy also embraces and harmonizes the epistemological traditions found in extant literature that are discrete, standalone, and mutually exhaustive. Yin-yang's both/and perspective frees them from paradoxical encumbrances hitherto imposed by legacy theoretical objectivist and subjectivist positions, and makes them teleologically coherent when explaining the epistemology of entrepreneurial opportunities with different ontological origins.

A second limitation is that this research draws case studies from a limited geographical region, specifically New Zealand, which may inhibit generalizability. However, the cases included startup-ventures that are seeking cross-border expansion. In fact, some of them have already established international markets, or have brought skills and knowledge from overseas. To broaden the generalizability of the model, future research can certainly incorporate cases from a wider geography.

Another limitation is the research's focus on the high-technology sector in New Zealand. Although nascent, the cases included in the study encompassed a broad range of business activities and technologies, which require multivariate knowledge and skills. Nevertheless, the empirical findings demonstrate that diversity has no bearing on entrepreneurship as a *process* phenomenon. Moreover, the high-tech industry is generally regarded as the 'place' where entrepreneurial activities happen most often. It is an important industry that holds promise for stimulating innovation, employment, and economic growth and diversification. The high-tech industry therefore deserves research attention.

This thesis purposefully limited its focus to the start-up stage. The process of starting up or restarting is not a phenomenon confined to individuals or small firms, but common also in mature corporations needing to undertake new initiatives or projects for their ongoing businesses. The process of starting up is therefore broadly relevant, regardless of the corporate setting or lifecycle of a business venture. In addition, focusing the venturing timeframe on the start-up stage makes empirical research manageable. Without the focus, the research will cover business processes that can stretch from start-up to expansion, growth, maturity, and beyond. Moreover, the entrepreneurial activities that happen during the start-up phase are foundational to

the subsequent and eventual success of a venture. Scrutinizing and developing a deeper understanding on start-up activities justifies the boundary of this study.

Having focused itself only on the process of startup venturing, this research may be criticized for lacking the depth in terms of the details on how decisions are made. Nonetheless, this research has provided an operationalized framework for entrepreneurial process to be articulated as an IO-nexus. It is complemented by philosophical position, concepts, notions, as well as the causality relationships among core variables involved in the processes of forming and exploiting entrepreneurial opportunities. The conceptual framework can form the basis for future research to delve deeper into other areas that are of interest. The areas may include how entrepreneurs conduct cognitive decision-making, especially how heuristics can help entrepreneurs to draw rational insights from interpreting new combinations of information (Busenitz & Barney, 1997; Hayward, et al., 2006; Kahneman, et al., 1982).

This research is limited because it only examines the start-up process in relation to entrepreneurial venture-opportunity. There can be other motivations for starting up; but where there is no ‘opportunity’ to pursue or as a motivating consideration, there is no basis for the venture to start up.

There can be outcomes to pursue that do not relate to root-origins of venture-opportunities. Financial performance and/or firm-level survival are usually named as outcomes (Ucbasaran, Westhead, & Wright, 2001). There are difficulties with determining these measures. They are prone to a variety of interpretations, such as whether they are to be defined *pre-* or *post-* the venture process. Measuring them is also subject to interferences, like personal expectations, aspirations, and skills. To overcome these challenges, this research has made an operationalized distinction of the various ‘outcomes’ that are associated with the startup-venturing process (see Figure 3.12 or Figure 6.1). By contextualizing the semantics that describe ‘outcomes’ (venture, performance/actual, and personal), meaningful discussion and analysis can thus be made to guide scholars in research and the entrepreneur in practice.

There is the possibility of researcher bias when selecting cases for research, and errors when interpreting the collected data. Researcher bias is mitigated as case selection was guided by the

theoretical propositions and requirements of this study. Interpretive errors, if any, were minimized by the iterative process of inquiry-interpretation, sense making, and meaning making done interactively by the researcher with the research respondents.

Finally, this study has taken a qualitative approach using multiple holistic case studies to better appreciate and empathize with the multivariate dimensions of startup venturing. It can be strengthened by additional, longitudinal, and quantitative studies, particularly in policy areas that look at the state of a country's entrepreneurship and innovation.

6.5 Concluding remarks

Entrepreneurship is a dynamic and multidimensional phenomenon. A primary value of this thesis is that it addresses the research trend and scholarly calls for a shift towards entrepreneurship study that is contextually more 'process' centric. The dualistic IO-nexus is a succinct and elegant notion in expressing the core determinants of entrepreneurship. However, a number of issues have handicapped its utility in explaining the entrepreneurial process.

On the one hand, the 'entrepreneur' factor has proven contentious and inconclusive, and therefore questionable as the thematic driver of the IO-nexus notion. On the other hand, while 'opportunity' holds promise as the alternative to advance the IO-nexus notion for entrepreneurship, the received 'either/or' dichotomous theoretical views in extant seminal works have created paradoxes and made its nature ambiguous and elusive to define.

This thesis solves the dilemma by (*re*)framing *opportunity*, the *entrepreneur*, and the entrepreneurial *process* of the IO-nexus in the holistic integrative yin-yang duality universe of the conceptual O-O-P framework. The Chinese yin-yang duality paradigm qualifies as providing:

“... [a] systematic organization, clarification, defense, and/or development of the fundamental theoretical structures underpinning more substantive research (Calás, Smircich, & Bourne, 2009; Suddaby, 2014).” (Ramoglou & Tsang, 2016, p. 411)

The ‘both/and’ spirit of yin-yang notion ‘defragments’ the received views of objectivists and subjectivists, and integrates them into a complete ‘whole,’ emanating a paradox-free O-O-P framework that explains and predicts on an *a priori* basis the *key aspects* of *opportunity*, which can be visualized, rationalized, and operationalized by the *opportunity-hexadecadrant* and *Taijitu*. The explanations and predictions cover the ontological nature of *opportunity* as *dualistic DS or SD nexuses* with *a priori* outcomes in various yin-yang market environments involving different levels of entrepreneurship, innovation, risks, and uncertainties. Other pertinent explanations and predictions include the nature and orientation of *entrepreneurial process* as a *dualistic IO-nexus* for forming and exploiting the different types of opportunity, with a new *fourth* (regression) approach identified and articulated to complement the three extant epistemological discourses.

At the *conceptual* level therefore, the yin-yang paradigm enables the O-O-P framework to explain, predict, and *operationalize* the notion of *opportunity* and, in turn, the *venture-outcome* that orientates the *entrepreneurial process (dualistic IO-nexus)* of interaction between the *entrepreneur* and *opportunity(dualistic DS or SD nexus)*. It helps to encapsulate extant views and explanations, and “generat[e] sequences of theories, progressively richer in explanatory power” (Bhaskar, 1998, p. 46). At the *empirical* level, this research reveals findings that are analytically generalizable to the explanations and predictions of the O-O-P framework as conceptualized and operationalized. In this sense, the yin-yang paradigm “can be a conceptual science, able to surprise (and change) us” (Bhaskar, 1998, p. 186).

Indeed, the metatheoretical intervention of the yin-yang duality philosophy that describes natural phenomena in the world can advance the progress of entrepreneurship research *conceptually* and *empirically*. It has the capacity to help the O-O-P framework articulate and operationalize in a logical, consistent, and coherent manner the dualistic IO-nexus of entrepreneurial process. Within the conceptual O-O-P framework:

“We [can] explain a set of empirical phenomenon and predict a set of outcomes not explained or predicted by conceptual frameworks already in existence in other fields.”
(Shane & Venkataraman, 2000, pp. 217, italics added for emphasis)

Although it is likely to encourage a broader debate in the field of entrepreneurship, the IO-nexus notion when integrated with the conceptual O-O-P framework as a single parsimonious theory does hold potential in fulfilling the “promise” (Shane & Venkataraman, 2000) of setting entrepreneurship forward as a distinctive domain for research, study, and practice. In the spirit of yin-yang duality expressed through the conceptual O-O-P framework, entrepreneurship *per se* can, as a part of yet apart from strategic management⁶⁴, be a “distinctive area of intellectual inquiry” (Shane, 2012, p. 11) that meaningfully explain and predict:

“... why, when, and in what form opportunities come into existence; when and how some people and not others discover these opportunities; when people exploit opportunities; how the nature of opportunities themselves influences the decision to exploit; why, when, and how different modes of action are used to exploit entrepreneurial opportunities; and the effect of the entrepreneurial process on society at large.” (Shane & Venkataraman, 2001, p. 18)

⁶⁴ “... two sides of the same coin: the coin of value creation and capture” (Venkataraman & Sarasvathy, 2001, p. 3)

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Appendix A – Information sheet

Department of Management, Marketing, & entrepreneurship

Telephone: +64-21-722268

Email: philip.lum@pg.canterbury.ac.nz

Date:

Information Sheet for participants



- ENTREPRENEURIAL OPPORTUNITY-(AD)VENTURING IN EARLY START-UP PHASE: EVIDENCE FROM THE FRONTLINE

My name is Philip Lum. I am a Ph.D. candidate at the University of Canterbury in Christchurch, New Zealand currently working under the supervision of Associate Professor Sussie Morrish and Professor Bob Hamilton. I would like you to participate in my research study.

The purpose of my Ph.D. study is to understand how an entrepreneurial *opportunity* and its related *outcomes* and *processes* are formed and exploited at the **start-up stage** of a business venture. If you agree to participate in the Project, I will interview you for about an hour to ask questions about the nature of your business idea/opportunity, and how you form and orientate the business outcomes and processes.

The interview is meant only to obtain information that would achieve the aim of this Project. All participants will receive a report on the Project.

Your participation in this Project is voluntary with unconditional right to withdraw at any time without penalty. If you withdraw, I will do my best to remove any information relating to you and your business as best as practically achievable.

The interview will be recorded on audiotape which content will be transcribed and forwarded to you for review. In addition, you will receive a summary report on the findings of this Project.

All the data will be securely stored in protected facilities and accessible only by my Supervisor and me. After ten years following the Project, all data will be destroyed.

I will take particular care to ensure the confidentiality of all data gathered for this Project. I will also take care to ensure your anonymity in publications or reports of the findings.

Other than being used for my PhD study, which will be a public document available through the University of Canterbury Library, the findings of this Project may be reported internationally, and in English language academic journals and non-fiction publications.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee, and participants should address any complaints to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (Email: human-ethics@canterbury.ac.nz).

If you agree to participate in this Project, please complete and email the attached Consent Form.

I am looking forward to working with you and thank you in advance for your contributions to the Project.

Thank you.

Philip Lum

Attachment – Consent Form

Appendix B – Informant's approval letter

Department of Management, Marketing, & entrepreneurship

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Email: philip.lum@pg.canterbury.ac.nz



Consent Form

ENTREPRENEURIAL OPPORTUNITY-(AD)VENTURING IN EARLY START-UP PHASE: EVIDENCE FROM THE FRONTLINE

I have read the Information Sheet and been given a full explanation of this research project. I have also been given an opportunity to ask questions.

I understand what will be required of me if I agree to take part in this Project, which will be part of a thesis available as a public document through the University of Canterbury Library.

I understand that my participation is voluntary and I may without penalty withdraw at any time whereupon my information will be removed as best as practically possible.

I understand that any information or opinions I provide will be kept confidential to the researcher and his supervisors, and any publications or reports of the findings will ensure my anonymity, unless I give my prior written consent to the contrary.

I understand that all data collected for this Project will be securely stored in protected facilities accessible only by the researcher and his Supervisors, and will be destroyed ten years following the Project.

I understand that I will receive a summary report on the findings of this Project. I have provided my email details below for this.

I understand that I can contact the researcher, Philip Lum (Email: philip.lum@pg.canterbury.ac.nz), or his supervisor, Associate Professor Sussie Morrish (Email: sussie.morrish@canterbury.ac.nz) for further information. If I have any complaints, I can contact The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (Email: human-ethics@canterbury.ac.nz).

By signing below, I agree to participate in this Project.

Name:

Date:

Signature:

Email address:

[Please email this completed consent form to Philip Lum (email address given at the top left-hand corner of this form) by [date]].

Appendix C – Interview guide sheet

PARTICIPANT’S INTERVIEW GUIDE SHEET:

ENTREPRENEURIAL OPPORTUNITY-ADVENTURING IN EARLY START-UP PHASE: EVIDENCE FROM THE FRONTLINE

A. Introduction

The purpose of the study is to understand how an entrepreneurial *opportunity* and its related *outcomes* and *processes* are formed and exploited at the start-up stage of entrepreneurship.

B. Scope of interview

To help me understand the nature of your business opportunity/idea, my interview will cover eight areas:

B.1 Offline (pre-interview) information collection

1. Some brief information about you

Your name:	
Contact details:	
Age (optional):	
Education level:	
Work experience:	

2. Some brief information about your company.

Name of Company	
Your position in the company	
Business description:	
Reason for starting company:	
Year founded/started:	
Objective of business opportunity/idea:	<i>[Delete whichever is inapplicable]</i> Are you: Creating an innovative product for a new (untested/unproven) market?

	<p>(i.e., I started with a product-idea/solution and am trying to find a market for it.)</p> <p>OR:</p> <p>Developing an innovative product idea for an existing market?</p> <p>(i.e., I saw an unfilled market demand/need and am trying to find a product/solution for it.)</p>
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Appendix D – Field questions

B.2 Interview questions

FQ1. What triggered your business opportunity/idea?

(Side reminder: e.g., was it a product idea or market need?)

FQ2. How did you identify/discover the business opportunity/idea?

FQ3. What is/are the outcome/s you need for the business opportunity/idea?

(Side note: e.g., How did you determine it/them?)

(Side note: e.g., Would you have done them differently?)

(Side note: e.g., Have you thought of aligning the outcomes in terms of the objective per your answer to Question #2) of your business opportunity/idea?]

FQ4. What were the first things you did (or had to do) to form the business idea/opportunity?

(Side note: e.g., How did you do them?)

(Side note: e.g., Would you have done them differently?)

FQ5. How did you decide to pursue the business opportunity/idea?

FQ6. How did you go about to try to achieve the outcome/s for the business opportunity/idea?

FQ7. What would you have done differently (if at all)?